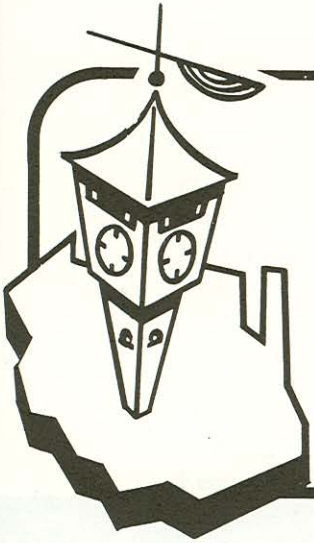
GRADUATE BULLETIN 1972-1973



Graduate College

Catalog of Courses

1973-1974

University of Wisconsin-Stout

Menomonie, Wisconsin 54751

Volume 59

Entered as Second Class Matter
at the Post Office at Menomonie,
Wisconsin under Act of Aug. 1912.

Quarterly. Address change notices
should be sent to Office of
Admissions, University of Wisconsin-Stout

10000-35-3K30003

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GENERAL INFORMATION

GRADUATE ADMINISTRATION

Robert S. Swanson.....Chancellor of the University
Stout, B.S., M.S.; University of Minnesota, Ph.D.

Wesley L. Face.....Assistant Chancellor for Academic Affairs
Northern State College, B.S.; Stout, M.S.; University of Illinois, Ed.D.

G. S. Wall.....Director of Graduate Admissions
Winona State College, Diploma; University of Minnesota, B.S., M.A., Ph.D.

Program Directors — Master's Degrees

Audio-Visual Communications.....James R. Daines
Stout, B.S., M.S.; University of Michigan, University of Houston, University of Missouri, Ed.D.

Guidance..... P. Robert Wurtz
Rockhurst College, B.S.; University of Wyoming, M.A.; Kansas State University, University of Wyoming, Ph.D.

Home Economics —
Clothing, Textiles and Related Art.....Rita Todd Mahan
Stout, B.S., M.S.; University of Wisconsin, Ph.D.

Home Economics —
Food Science and Nutrition.....Lorraine C. Dahlke
University of Wisconsin, University of Minnesota, B.A.; State University, Iowa City, M.S.; Ohio State University, Ph.D.
Home Economics Education.....Jane Rosenthal
Stout, B.S., M.S.; Colorado State University, Ed.D.
Industrial Education.....Lawrence S. Wright
Stout, B.S., M.S.; University of Missouri, Ed.D.
Industrial Technology.....Raymond L. Keil
Bradley University, B.S.; University of Arkansas, M.Ed.; Michigan State University, Ph.D.
Vocational Education.....Harold Halfin
Fairmont State College, A.B.; Stout, M.S.; University of West Virginia, Graduate Study
Vocational Rehabilitation.....Walter A. Pruitt
University of Denver, B.A., M.A.; Colorado State College, Ed.D.
School Psychology.....P. Robert Wurtz

Program Directors — Ed. S. Degrees

Guidance and Counseling.....P. Robert Wurtz
Industrial and Vocational Education.....Harold Halfin

UNIVERSITY MISSION

Stout makes a unique contribution to the University of Wisconsin System by concentrating its efforts in those higher education programs directly related to industry and technology, home economics, business, the helping professions, and applied arts. Concentration within these selected areas enables the University to develop and offer highly specialized instruction in great depth, in keeping with and building upon the original visions of its founder, Senator James H. Stout. Recognizing the interdependence of knowledge in all areas and the need to humanize, individualize and personalize all aspects of student life, the University seeks to complement its specialized education with broader learning experiences and opportunities essential for personal, professional, esthetic and social effectiveness.

The original programs at Stout were based on a firm commitment to integration of theory and practice; thought and action. In keeping with this, Stout still focuses on experimentation with new educational strategies and instructional technology in the interest of improving learning. Laboratory and practical work are primary components of both content and approach. Stout has the ability to react rapidly to expressed needs in its field of specialization and related areas; to try creative approaches on an intensive university-wide basis; and to evaluate these approaches to determine if they should be implemented.

In addition to instruction, Stout focuses on applied research and public service in areas related to its specialties. Changes in home economics, business, industry, and technology underscore the need for research to keep programs relevant. Increased attention to the welfare of individuals has caused a continuous examination for the role of the helping professions. Through the outreach efforts of continuing education, Stout provides services stemming from its specialization to

enrich the lives of Wisconsin citizens. The size and quality of its educational programs enable Stout to provide statewide and national leadership.

HISTORY

If James Huff Stout were to arrive today on the Stout campus after an absence of 60 years, he would scarcely be surprised at the growth of the institution which he founded. Senator Stout was a man of great vision. An industrialist, he saw that the great need of the future industrial society was a different kind of education, an education broader than that provided by the traditional curriculum. Thus, the college was started — from the vision of one man about the future of America. James H. Stout came to Menomonie in 1889 to help run a major lumbering concern — Knapp, Stout & Co. This quiet, dignified man put his money and his talents to work on a variety of civic enterprises including education, library development, horticulture, art, conservation, and the good roads movement. His pet idea, however, was industrial education, that is, manual arts and domestic science, introduced as a part of public school education.

His plans took shape in a cooperative effort with community leaders, first in a two-story frame building erected on the corner of Main and Broadway, then in a new building erected where Bowman Hall now stands. This building burned to the ground, but James Stout immediately agreed to build a still more ambitious structure, now Bowman Hall. This new structure, built in 1897, offered in its tower a symbol linking through the years the Stout Manual Training School, The Stout Institute, Stout State College and Stout State University.

Stout's kindergarten schools and the schools of manual training and domestic science brought a demand for the training of teachers. In 1903 the Stout Training Schools were born, then incorporated in 1908 as The Stout Institute. In spite of Senator Stout's death in 1910, the vision of the founder lived on. Senator Stout's family relinquished the school to the State of Wisconsin.

Lorenzo Dow Harvey, a national figure in the area of industrial education, became the president of The Stout Institute. Harvey was also a man of great vision. Under his leadership, Harvey Hall and Ray Hall were erected. The greatest accomplishment of President Harvey, however, was the extension of The Stout Institute to a four-year college.

The years of our war with Germany put a dent in the enrollment of The Stout Institute, but the college emerged from the war stronger than ever. In 1922, President Harvey died rather suddenly. His place was taken temporarily by Clyde A. Bowman, fated always to be second in command. His steadying hand in the administration of three presidents helped the institution to survive difficult times.

Burton E. Nelson became president of The Stout Institute in 1923. Under his direction, the two-year and three-year programs were phased out and The Stout Institute began to meet the standards of accrediting agencies. The 1930's were times which tried the souls of the administration and faculty when salaries were cut, staff was laid off, and enrollment dropped. The Stout Institute emerged from the depression years with the same high standards which had made it a world-famous school. The world conflict of the 1940's brought great problems which

Burton E. Nelson faced with courage in his declining years. He noted in his diary "I quit when Hitler does" and made good his promise.

President Nelson was succeeded by Verne C. Fryklund, whose books in the field of industrial education had made him a national figure. As President Fryklund took over, veterans began to swarm back to school, accompanied by girls who wanted to be where the boys were. The swelling enrollment brought welcomed problems solved by the addtion of new buildings. Administratively, The Stout Institute was shifted from the Board of Vocational and Adult Education to the Board of Regents of the Wisconsin State Colleges.

Each succeeding president of the college has given the dream of Senator Stout a slightly different interpretation. All of these interpretations have become a part of the heritage. President Fryklund, for example, interpreted the dream in terms of vocational, technical, industrial arts and home economics education. President Fryklund's retirement brought a different concept.

William J. Micheels, a native of Menomonie and a 1932 Stout graduate, interpreted the dream in a broader sense. He brought to prominence again, for example, the blending of the artist and the artisan which had been so much a part of the thinking of Senator Stout.

In 1971, enabling legislation was passed merging the Wisconsin State University System with the University of Wisconsin System. Stout State University was changed to the University of Wisconsin—Stout under the merger. Thirteen universities now make up the University of Wisconsin System.

Stout overlooks scenic Lake Menomin in Menomonie, a pleasant city with a population of 11,000. Menomonie is located on Interstate 94, an hour by automobile from Minneapolis and St. Paul and 30 minutes from Eau Claire.

On Sept. 8, 1972, Dr. Robert S. Swanson was named by the Board of Regents to succeed Dr. Micheels who stepped aside for reasons of health.

A veteran member of the Stout staff, Dr. Swanson received his Bachelor's and Master's degrees in Industrial Education from Stout and his Doctorate from the University of Minnesota in 1955. He began teaching while an undergraduate at Stout. From a part-time instructor, Swanson moved up the educational ladder. He served as chairman of the Department of Wood Technics, assistant dean and then dean of the University's School of Applied Science and Technology, director of the Summer Session and dean of the Graduate College. Under his leadership, the Graduate College tripled its enrollment and doubled the number of degree programs offered.

A recognized leader in his field, Swanson is a past president of the American Industrial Arts Association. He was named "man of the year" of the American Council of Industrial Arts Teacher Educators in 1967 and made an "honorary member" of the National Association of Teacher Educators in 1970.

FACULTY

Stout's full and part-time faculty numbers 435. Faculty members hold major offices in many professional organizations, notably home economics, industrial education, industrial technology, vocational rehabilitation, counseling and placement. Some serve as regular staff experts on professional periodicals, while others are frequent contributors. Books in the fields of human development, education, psychology and technology have recently been published by Stout faculty. The art faculty's prize-winning work appears frequently in various parts of the country and comprises part of the University's own permanent collection.

LIBRARY

Media Retrieval Services (The Robert L. Pierce Library) has a print collection of more than 135,000 volumes, about 1800 periodicals, and more than 1500 films, tapes, records and slides. Facilities are interspersed with 960 carrel and table spaces for the convenience of users.

The library has excellent specialized collections in the fields of graduate work offered. Microfiche collections from all ERIC centers are available. Audio-visual facilities include graphics, recording, television, photography, motion picture, and instructional media labs. A media library and a self-instruction laboratory are recent additions.

Facilities and equipment are available in the Pierce Library for utilizing programmed instruction, packaged instruction, audio cassettes, audio tape reels, records, filmstrips, 2 x 2 slides, 16mm films, standard and super 8mm films, tape-slide programs, and all types of print media.

Instructional Technology Services are housed in the Communications building. Professional media specialists are available for consultation with students and faculty concerning the utilization, selection, procurement, design and production of instructional media. Graphics, still photography, motion picture production, television and sound recording services are housed in the 18,000 square foot area.

FACILITIES

Modern and well-equipped facilities mark Stout's 102-acre campus. In recent years, 14 major facilities have been constructed around the perimeter of the central campus core.

The recently completed Applied Arts building houses art and music, besides a number of technologies. A Home Economics facility (under construction), one of the most modern in its field in the nation, will house most of the home economics programs.

The Science and Technology building, another $4 million facility, contains more than 130,000 square feet of floor space and has a total of 32 laboratories, nine classrooms, and 90 faculty offices. Besides technology, it houses the departments of biology, physics and chemistry.

Other modernization programs — a vocational rehabilitation facility and a library addition — are in the initial planning stages. A $375,000 closed circuit television system serves the campus. A modern computer center is available to students.

THE GRADUATE COLLEGE

Accreditation: The graduate program at Stout is fully accredited by the North Central Association of Colleges and Secondary Schools (NCA) and the National Council for the Accreditation of Teacher Education (NCATE) to offer work at the Master's (fifth year) and Education Specialist (sixth year) levels.

DEGREE PROGRESS

Procedures are developed to facilitate orderly progress toward the degree. Each student is assigned an advisor who aids him in his plans, but each step is the responsibility of the student. A chart summarizing various details is in the back of this bulletin for handy reference.

Admission: Admission to a degree program is based on two types of criteria: (1) academic promise, as shown by scholastic success in previous college work, scores on standardized tests, and statements from individuals who have knowledge of the student's ability. (2) appropriateness of background for advanced study in the area as shown by the pattern of course work completed previously and statements certifying practical experience.

Once the student has been admitted to the program, it is the University's intention to aid him in progressing toward the degree, while at the same time evaluating his progress. In certain cases, progress checks may deem it desirable that the student modify his plan or discontinue his program.

Program Plan: Requirements for each program are outlined in this bulletin; the student should study them and plan a schedule accordingly. At the first enrollment, each student will make a program plan sheet with his advisor; this may be revised subsequently but should serve as a guide to each enrollment.

Examinations: (1) All students are required to complete the general aptitude section of the Graduate Record Examination, prior to or during their first term of enrollment. This examination is given at a number of test centers (Stout is one) on only certain dates each year. Information is available in the Graduate office on dates and procedures. (2) A qualifying examination, generally prior to or as a part of degree candidacy, may be required in specific degree programs.

Registration for Classes: Ordinarily, there is a preregistration for each term approximately six weeks in advance. A day or two at the beginning of each term is also set aside for this purpose. Summer session preregistration may be accomplished by mail. The student should carefully check on his proposed program against his program plan; his advisor's signature is also required.

Periodic Evaluation of Scholastic Standing: At the conclusion of each term an evaluation of scholastic status will be made according to the following schedule.

Scholastic Status at Beginning of Term	*G.P.A. for Term*	*Cumulative G.P.A.*	*New Scholastic Status**
Full	3.00 - 4.00	3.00 - 4.00	Full
	0 - 2.99	3.00 - 4.00	Full
	0 - 2.99	0 - 2.99	Probation
Probation	3.00 - 4.00	3.00 - 4.00	Full
	3.00 - 4.00	0 - 2.99	Probation (cont.)
	0 - 2.99	0 - 2.99	Drop**

* New status will generally be assigned only when at least six credits have been completed beyond total on which previous status was based.

** Specific reaction from program directors required.

Periodic Review of Professional Promise: Because scholastic achievement is only one factor in professional success, the program director may arrange for the staff who have had appropriate contact with the student to periodically review his professional promise. Especially in cases where such professional promise is questioned, the program director and appropriate faculty will discuss an improvement program with the student. Certification for degree candidacy and graduation may involve evaluation of this kind in addition to scholastic attainment.

Degree Candidacy: Degree candidacy is a means of defining the student's total degree plan and evaluating his progress toward that goal. Full-time students will apply for degree candidacy by the end of their first term of enrollment. Part-time students will apply when eight credits of graduate work at Stout have been completed. Candidacy application forms and specific directions are available in the Graduate College office. Candidacy is applied for by the student, recommended by the program director and awarded by the Graduate College.

Research Project: Each degree program requires some kind of research or scholarship project. The student should confer with his advisor early in his program to allow ample time and preparation for completion of an appropriate project.

Transfer of Credits: A student planning to transfer graduate credits from another institution to a program here should check with his advisor in advance concerning applicability of the proposed work. A form to request transfer is available in the Graduate office.

Intent to Graduate: Students are awarded degrees at the end of the first and second semesters and the summer session. Students planning to finish degree requirements within a given term should file an "Intent to Complete" form available in the Graduate office.

Graduation Ceremonies: A graduation ceremony is held at the end of each semester and the summer session. Instructions for graduation will be sent to all persons who have filed an "Intent to Graduate."

Award of the Degree: After all grades and credits have been recorded (usually about two weeks after the end of each semester or summer session), the student's transcript will be checked to determine that program requirements have been met with an overall grade point average of at least "B" (3.0). The student will be mailed his diploma and a complete transcript certifying his degree. Students needing such certification for salary purposes prior to the official statement may request a letter from the Dean of the Graduate College.

ACADEMIC INFORMATION

Academic Calendar Year: The University's academic year is divided into two semesters. Each semester is also divided into two nine week quarters. The student should recognize that the Stout designation of a quarter represents only one-half a semester and should not be confused with the quarter system in many universities which is 12 weeks in length. Courses scheduled on the quarter basis at Stout meet twice as often each week as courses scheduled on the semester basis for the same credit.

The Summer Session: Each year Stout offers 10 weeks of summer school. A two-week presession begins immediately after the close of the regular academic year. This is followed by the regular eight-week summer session. Stout is also offering courses within the regular eight-week session of varying lengths of time so that a combination of one, two, three or five week courses can be taken.

Credits may be earned at the rate of one semester hour per week of attendance. This makes it possible to earn as many as 10 credits during a summer. Because of the large number of graduate students in attendance during the summer, practically all graduate level courses are offered each summer. The Summer Session Bulletin is published each April. It contains complete information about offerings, class schedules, enrollment procedures, degree programs, and housing. A copy will be sent on request.

Grading System: The Graduate College uses a seven step grading plan.

Grade	*Grade Point Value*	*Description*
A	4.0	Exceptional achievement at the graduate level
B+	3.5	Above average graduate level work
B	3.0	Average graduate level work
B—	2.5	Below average graduate level work
C	2.0	Acceptable graduate level work
D	1.0	Questionable graduate level work
F	0.0	Failure

An "incomplete" may be given when a student fails to complete his work. Incompletes not cleared within a year after the course would normally have been completed will be changed to "W" (withdrawn); if the student desires credit after that time, he must re-enroll for the course. This policy applies to research projects also.

Textbooks: Graduate students must supply their own textbooks. These may be purchased in the book store located in the Memorial Student Center or elsewhere as chosen by the student.

GENERAL POLICIES

The following policies apply to all graduate programs at Stout (with a few exceptions noted):

Number of Credits Required. A Master's degree program will require at least 30 semester credits. An Education Specialist program will require at least 36 semester credits beyond credits completed in the Master's degree.

Credits Required in Courses Open Only to Graduate Students. All Master's degree programs will require at least 15 credits in course work open only to graduate students; Education Specialist programs require at least 18 credits in this level of course work. In the University of Wisconsin System, such courses carry numbers between 700 and 899.

Residence (On-Campus) Course Work. A Master's degree program must include at least 15 credits specified as Stout on-campus course work; an Education Specialist program must include 18 credits of this kind of work. Stout's extension courses are not considered residence work.

Time Limits. All credits toward a degree program, including transfer credits, must have been completed within seven years of the award of the degree.

Optimum Credit Load. Usually, graduate students may take a maximum of 16 credits a semester. Students with half-time assistantships are limited to a maximum of 11 credits a semester; quarter-time assistants are limited to a maximum of 14 credits a semester. During the summer session, the maximum credit load is an average of one semester credit a week.

Transfer Credits. In general, a maximum of nine credits may be transferred from any accredited graduate school. In appropriate cases, as many as 15 credits may be transferred if earned from one of the institutions in the University of Wisconsin System. Such credit by transfer, to count toward a degree, must be judged by the program director to be appropriate as a required or elective course. Students who have been admitted to a program should get approval of the program director prior to taking such work. Any courses to be transferred must be clearly identified as having been taken for graduate credit. Transfer work may be earned either through on-campus or through extension attendance.

Continuing Education. Any amount needed beyond the required 15 Stout residence credits (see 3 above) may be earned through Stout's Continuing Education program. That office offers a wide range of work, including graduate only (700-899 level) and other appropriate work awarded graduate credit. The student should consult the program director relative to appropriateness of such work for meeting the requirements of the program.

Correspondence Work. No credit toward a graduate degree will be allowed for correspondence work.

Evaluation for Retention. One measure of retention is earning a grade point average of at least 3.0 for the Master's and 3.25 for the Ed.S. degree on all work needed to fulfill the degree requirements. Another measure of retention is through evaluation by the program director of the student's demonstrated potential for success in the field. In cases in which a student is recommended to be dropped, he shall have opportunity to be heard before such action is taken.

Petitions. In cases where exception to these policies or other regulations seems justified, a student may petition the program director — who may make or deny the exception. Petitions for such exceptions are to be approved by the Dean of the Graduate College.

FEES 1972-73

Graduate fees are set by the University of Wisconsin Board of Regents and are subject to change. Current fees are:

	Regular Semester
Incidental Fee	
Resident (Wisconsin), full-time	$ 294.00
Resident, part-time, per credit	26.75*
Nonresident, full-time	1,041.50
Nonresident, part-time, per credit	110.00*
Special Fees	
Late Registration	10.00
Graduation Fee	7.50

*Per credit charge does not include Student Center fee or the Activity fee. These charges are based on the number of credits carried.

Part-time graduate students are those carrying eight credits or less in the regular session.

Split program students (eligible undergraduates carrying graduate work simultaneously) pay the applicable undergraduate fee. Any expense incurred by the graduate during the conduct of research problems — such as the printing of questionnaires and maps, typing, thesis binding, etc. — is the responsibility of the student.

Refunds: Semester Basis

100% for the first week, less $50
80% second week
60% third and fourth weeks
0% fifth week

In determining withdrawal date, the University uses the date the student notifies the school of the withdrawal; or if the student fails to notify the school and is otherwise unable to verify date of withdrawal, the date of the request to refund will be used to determine the refund.

Students who enter military service by enlistment, draft or otherwise, shall receive either a full refund of fees or receive course credits for the term. Other exceptions to the above may be made upon approval of the Chancellor and the designated Board of Regents representative.

FINANCIAL AIDS

Several kinds of financial aids are available to graduate students who fully meet all entrance requirements. Some of these aids are designed to provide professional experience as well. Application for assistantships should be filed with the Dean of the Graduate College by March 15, preceding the academic year of planned attendance. Conditions for assistantships and other aids are subject to change.

Graduate Nonteaching Assistantships: The half-time graduate assistantship requires 20 hours of professional service per week in an area related to the student's program. The student may not accept other employment during this period. A stipend of $2,500 for Master's candidates and $3,125 for Ed.S. candidates per academic year is provided. The nonresident graduate assistant, in addition, pays only the resident incidental fee, the nonresident portion being waived. The student's scholastic load is limited to a maximum of 11 credits per semester. This ordinarily requires attendance during the summer session preceding and/or following the regular year of such service to earn the degree. Though no stipend is provided for the summer session following his assistantship, the student is exempt from nonresident tuition.

The quarter-time graduate assistantship requires 10 hours of professional service per week in an area related to the student's program. A stipend of $1,250 for Master's candidates and $1,562 for Ed.S. candidates per academic year is provided. The quarter-time graduate assistant pays all fees. The student's scholastic load is limited to a maximum of 14 credits per semester.

Laboratory Assistantships: The laboratory assistant teaches a laboratory or discussion session, generally about 10 contact hours per week. A stipend of $2,500 per academic year is provided. The nonresident laboratory assistant, in addition, pays only the resident incidental fee, the nonresident portion being waived. The student's scholastic load is restricted to 11 credits per semester. This ordinarily requires attendance for a summer session preceding and/or following the regular year of such service to earn the degree.

Residence Hall Counselorships: Opportunity is available to a graduate student to serve as a residence hall counselor. The monetary benefit of this offsets the cost of room and board. Application for such service should be made to the Director of Student Housing.

Vocational Rehabilitation: Traineeships are available for students in the Vocational Rehabilitation program. Grants include tuition plus $1,200 per semester and $600 for the summer.

FINANCIAL AIDS OFFICE

The following programs are administered by the Financial Aids office:

Wisconsin State Student Loan Fund: A loan is available from the Wisconsin State Student Loan Fund for those students who are residents of Wisconsin and are in need of loan assistance. The maximum amount of such loans is limited to $1,500 annually. There is no interest charged while the borrower is in attendance at Stout. Interest at a seven percent rate is charged beginning nine months after the borrower terminates his attendance at Stout.

National Direct Student Loans: The National Direct Student Loan program is available to graduate students in need. The amount of the loan is determined by the availability of funds and the need of the student. Repayment of the loan is to be completed within a 10-year period, which begins nine months after the borrower terminates his program. Interest at three percent per annum accrues at the time the repayment schedule begins. The 50 percent forgiveness feature for full-time teaching has been dropped. However, there is still a forgiveness feature of 100 percent for teachers of the handicapped, teachers employed in low-income areas and Head Start programs.

International Student Scholarships: Awards are made to students from other countries after admission who have a financial need. The award consists of exemption of nonresident tuition. Interested students should follow all degree application procedures which includes the

application for an international student scholarship. Applications should be received by March 15 with awards announced about May 1. The Graduate office will forward the applications to the Financial Aids office.

Work-Study Grants: Graduate students as well as undergraduates may apply for jobs at an hourly rate under the federal work-study program.

OFF-CAMPUS PROGRAMS

Continuing Education Program: The University offers a program of evening and Saturday morning Continuing Education classes. Credits earned through enrollment in these off-campus courses are considered as extension credits. They are transferable to Stout on the same basis as they are to other colleges and universities. Registration for these courses is completed at the first class meeting. Textbooks required for the class by the instructor are made available for purchase at the first class meeting.

Course numbers, titles and content are the same as those offered on the University campus. To be awarded graduate credit for extension work requires that the student be admitted to the Graduate College.

Independent Studies: A flexible academic program called Independent Studies is offered by most departments to help develop students into self-directed learners. This program provides more scope and depth in the curriculum by encouraging students to: investigate areas of interest not currently included in the normal course offerings; study areas and develop projects which cut across course boundaries; and delve more deeply into specific parts of an existing offering.

The Independent Studies program is open to all graduate students. (Credits are awarded on the basis of expending approximately 40-50 hours of effort for each credit.) The same conditions for registration apply as for any other course. In addition, approval for an Independent Study course must be obtained. Application forms are available in the Independent Study — Field Experience office. The study is approved by the student's advisor and the chairman of the department most closely related to the particular study area. After this approval, a faculty member is selected jointly by the student and the department chairman to act as a study advisor. Independent Study courses may be pursued while the graduate student is not on-campus if prior arrangements have been made.

Field Experience Program: Students in some graduate programs are encouraged to obtain part of their education program off the Menomonie campus through a special graduate level Field Experience program. This program allows a graduate student to receive academic credit for off-campus experiences and study relating to his program while employed in an approved field position. The graduate level part of the program has been specifically designed to aid in-service teachers, counselors, and administrators in using summer work experience or supervised observation of business and industry to benefit their performance when they return to their jobs in the fall. Increased time credit towards vocational certification is possible in many situations for students employed in positions relative to their teaching field and enrolled in Stout's Field Experience program.

All necessary forms and reports can be handled by mail and a person enrolled need not be on campus. Application must be made prior to beginning work. Further information and application forms may be secured by contacting the Independent Study — Field Experience office.

HOUSING

Residence hall facilities are available for graduate students. It is recommended that graduate students seek accommodations in the south residence hall complex. The University currently provides residence hall accommodations for approximately 3,000 students. Students living in residence halls are required to contract for their meals in the food service facilities as provided. The meal contract plan provides for two options — either 14 or 19 meals per week.

Rooms are available immediately preceding registration day in the fall. All rooms are assigned for the entire academic year. Each room is furnished with single beds and inner-spring mattresses, pillows, dresser, study table, chairs, study lamp, and book case. Drapes and bedspreads are supplied. The 1972-73 semester charges, if paid in advance, for room and board including sales tax are:

	Semester
Double Room (14 meal plan)	$470.36
Double Room (19 meal plan)	$493.24
Single Room (14 meal plan)	$545.36
Single Room (19 meal plan)	$568.24

Room and board payment may also be made by installments. A penalty of $5 is assessed for all late payments, whether by semester or by installment.

A $75 room deposit is required on all room reservations. The deposit submitted with the residence hall application will be applied against the final payment for the second semester. Room reservations may be cancelled and the deposit will be refunded provided request of such cancellation is received, in writing by the University Housing office on or before July 15. The deposit will be forfeited if cancellation is received after July 15.

Students are requested not to bring additional furniture, particularly floor lamps. Radios, phonographs, and television sets are permitted in the rooms provided the students comply with the regulations for the use of this equipment. Television sets are available for general use in the main lounge of each building.

At the present time, Stout has a limited number of married student apartments. These are barracks-type units with two bedrooms, a bath, kitchen alcove, living room and limited storage space. Married student facilities are also available in the community of Menomonie. Married students are encouraged to obtain housing on their own in addition to seeking the assistance of the University. Inquiries for student housing should be directed to the University Housing office.

STUDENT SERVICES

University Counseling Center: The University's Counseling Center, located in Room 16 of Harvey Hall, is maintained to help undergraduate and graduate students obtain the maximum benefit from their university careers and to develop to the full limit of their potential. The services of the Counseling Center include vocational guid-

ance, career information, assistance with academic problems and study habits, specialized testing, and personal counseling. Students who seek assistance are given the opportunity to work with a counselor in a confidential relationship in which they can explore their aspirations, interests, aptitudes, abilities, personal characteristics, and increase self-understanding.

Counseling is normally provided through appointment; an appointment is not necessary for the student who feels the need for immediate assistance. There is no charge for the counseling services.

Graduate students who are in doubt about their vocational future, who are experiencing academic difficulties, or who are concerned about personal problems are especially invited to contact the Counseling Center.

Health Service: The University maintains a Student Health Service in the Security building at the extreme north end of the campus. The facility is staffed by a physician from 9 a.m. to 1 p.m. daily, five days a week. It is open from 8 a.m. to 4:30 p.m. Standard examining and laboratory facilities are available. The facility is supported by a student health fee.

Recreation: Athletic and social facilities are an important part of the campus. The University provides its students with a rich and well rounded college experience so that as they develop academic and professional competence, they also gain experience and insight into many different activities and relationships.

Athletic facilities include the Health and Physical Education Center, Nelson Field and 10 outdoor lighted tennis courts. The Center offers open recreation, intramural athletics and physical education instructional classes. The building provides courts for tennis, badminton, volleyball, basketball and archery, as well as individual rooms for weight training, gymnastics and dance. A swimming pool is also located in this area.

Lake Menomin, within the city, offers the finest in fishing, swimming, boating, canoeing and water skiing. Similar opportunities are available on the nearby lakes. Ski enthusiasts will find excellent opportunities within commuting distance. Game hunting (bird and deer) opportunities are to be found in the immediate vicinity. The Menomonie Country Club has a nine-hole golf course.

Military Obligations: Student deferments are no longer available. However, deferments may be continued for as long as the student is in continuous attendance working on the program for which the deferment was granted. The continuation of the deferment must be requested each academic year.

Menomonie maintains a unit of the Wisconsin National Guard. Many students attending Stout belong to this unit. It is possible for a man who joins a national guard unit and who then attends that unit's weekly drills to be exempt from the selective service. A student who belongs to another guard unit within Wisconsin can continue his drill in Menomonie and still maintain the military status which he had while at home. Persons in national guard units in other states can make somewhat similar arrangements.

Veterans Service: Special assistance is given veterans by the Registrar. This office provides veterans with current information on veterans affairs and maintains liaison with the Veterans Administration, Department of Veterans Affairs, and the County Veterans Service Officer.

Parking: Motor vehicles may be brought on campus by students if there is a real need. Parking facilities on or near the campus are limited. Students who expect to use University-owned or controlled parking lots must register their vehicles and observe the regulations issued by the Security office. Limited parking adjacent to the residence halls is available to those living in them. The City of Menomonie has restricted parking ordinances which limit street parking both day and night.

Career Planning and Placement Services: Graduate students are urged to register with the Career Planning and Placement Services office, whether they are employed or not. Essentially, this involves completing various placement forms and securing references from professors in the Graduate College and recent employers.

The Career Planning and Placement Services office is maintained to provide service for seniors, graduate students and alumni. The goal of the office is to give effective support to the placement efforts each individual is expected to make in securing the position best for him. Every effort is made to bring to the attention of candidates for placement, information about vacancies, trends in supply and demand, data about salaries and conditions of employment, and to recommend effective application techniques.

There is no charge to you for any service provided by the Career Planning and Placement Services while you are in the process of seeking a position. However, there will be a $25 processing fee for all graduates who wish to use our facilities and services if they do not establish their credentials in the Career Planning and Placement Services office **prior** to graduation.

Alumni are advised to keep their placement credentials updated and to make free use of the service available to them when they desire to relocate. A form for registering for placement may be secured by writing to the Director of Career Planning and Placement Services. Other graduate students are invited to establish a placement file and to make use of our facilities and services when they are within one semester of meeting the requirements for graduation.

DEGREE PROGRAMS

AUDIO-VISUAL COMMUNICATIONS

Master of Science Degree. To meet the growing need in education for innovation and greater efficiency in instructional technology, the Master of Science degree program in Audio-Visual Communications is designed to prepare the student for a professional career in educational media. At the completion of the program, the student will be qualified to plan, produce and utilize materials, to teach courses in Audio-Visual Communications, and to develop, supervise and administer audio-visual programs in education, industry, and government. Stout graduates are serving in such capacities throughout the United States and in foreign countries.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

The student should possess a valid teacher's certificate or sufficient credits to qualify for a teaching certificate and two years of successful teaching experience before the degree is awarded. These requirements may be waived for those who are not seeking employment as audio-visual coordinators or directors in the elementary and secondary schools.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall graduate grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) approval for degree candidacy at the appropriate time; and (c) a course distribution as outlined below:

Preparation in Research (6-10 Cr.)		Credits
421-740	Research Foundations	4
407-722	Problems in Audio-Visual Communications (or)	2
407-770	Thesis — Audio-Visual Communications	6

Preparation Basic to Program (14-20 Cr.)		
107-504	Elementary Photography	2
107-605	Advanced Photography	2
407-535	Film: History and Appreciation	3
407-636	Fundamentals of Motion Picture Production	3
107-645	Color Photography	2
407-560	Audio-Visual Communication	2
407-561	Preparation of Audio-Visual Materials*	2
407-593	Television Production Techniques	3
407-694	Instructional Communications Systems	2
407-730	Media Retrieval Systems	2
407-732	Planning Media Facilities	2
407-747	Communications Media Design	2
407-751	Programmed Instruction	2
407-759	Seminar in Educational Media Research	2
407-760	Educational Media Administration*	2
407-799	Independent Study	1-2
479-730	Advanced Psychology of Learning	2

Preparation for Further Individual and Professional Development (To total 30 Cr.)		
391-554	Television Programming and Performance	3
421-681	American Higher Education	2
421-700	Philosophy of Modern Education	2
421-702	Principles of Supervision	2
421-726	Administration	2
354-741	Digital Computer Programming	2
421-738	Elementary School Curriculum* (or)**	2

421-739 High School Curriculum* 2
150-713 Introduction to Educational Systems Analysis 3

*Required for certification as an audio-visual coordinator in Wisconsin.
**State certification requires at least two semester hours of credit in curriculum at the level (elementary or secondary) at which the applicant is not certified as a teacher.

GUIDANCE

Master of Science Degree. The program in guidance provides a basic preparation and a number of emphases leading to professional employment as elementary school counselor, secondard school counselor, vocational-technical school counselor, and employment counselor. In addition, graduates of the program are presently serving in a variety of social service settings such as student personnel services in colleges, youth opportunity projects, religious work, and other areas where counseling is involved.

Persons planning to pursue this kind of work should have a sincere interest in social service and the ability to develop a helping relationship with others. Graduates seeking positions in schools should be aware of the specific education and experience requirements for certification.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

Applicants for elementary school counseling should be certifiable elementary teachers and have at least two years of teaching experience prior to completing the Master's degree. A guidance internship may be arranged in lieu of teacher certification and experience. Students without previous course work in Child Psychology and Elementary School Curriculum may be required to take additional undergraduate or graduate credits beyond degree requirements.

Applicants for secondary school counseling should be certifiable secondary school teachers and have at least two years of teaching experience prior to completing the Master's degree. A guidance internship may be arranged in lieu of teacher certification and experience. At least one course in adolescent psychology must be completed at the undergraduate level. Students who are not eligible for teacher certification will complete courses in the following areas in addition to degree requirements: Philosophy of Education, Curriculum Theory and Development, and Psychology of Learning or Psychological Foundations of Education.

Applicants for vocational-technical school counseling should be certifiable vocational-technical teachers (from any of the fields) and have at least three years of teaching experience prior to completing the Master's degree.

Applicants for employment counseling need have no particular undergraduate background, but a variety of work experience is desirable. Persons with some employment counseling experience will find this program particularly applicable.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall graduate grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) approval for degree candidacy at the appropriate time; and (c) a course distribution as outlined below:

Preparation In Research (6-10 Cr.) Credits

421-540 Research Foundations 4
413-531 Problems in Counseling and Personnel Services (or) 2
421-570 Thesis — Counseling and Personnel Services 6

Preparation Basic to Program (12 Cr.)

413-501 Introduction to Guidance and Counseling 2
413-675 Counseling Theory 2
479-760 Personality 2
413-690 Aptitude and Achievement Appraisal 2
413-752 Group Dynamics 2
413-790 Supervised Counseling Practicum 4

Preparation in Emphases Within Program (select one emphasis)

Emphasis in Elementary School Counseling (16 Cr.)

413-629 Guidance in the Elementary School 2
413-748 Diagnosis and Remediation of Learning Difficulties 2
413-741 Individual Mental Testing 2
413-765 Organization and Administration of Guidance 2
413-501 Introduction to Guidance and Counseling 2
421-630 Educating Children with Special Learning Needs 2
413-647 Behavior Problems of Children 2
413-737 Curriculum and Methods in Career Education 2

Emphasis in Secondary School Counseling (10 Cr.)

413-501 Introduction to Guidance and Counseling 2
413-691 Theories of Career Development 2
421-739 High School Curriculum 2
413-765 Organization and Administration of Guidance 2
413-735 Information Service and Vocational Guidance 2

Emphasis in Vocational Technical School Counseling (14 Cr.)

469-602 Principles of Vocational, Technical and Adult Education ... 2

413-734 Technical-Vocational Education Student 2
413-691 Theories of Career Development 2
469-792 Administration of Vocational, Technical and Adult Education 2
421-700 Philosophy of Modern Education 2
413-501 Introduction to Guidance and Counseling 2
413-735 Information Service and Vocational Guidance 2

Emphasis in Employment Counseling (6 Cr.)
413-501 Introduction to Guidance and Counseling 2
413-691 Theories of Career Development 2
413-750 Appraising the Individual 2

Preparation for Further Individual and Professional Development
While the Master's degree program (especially the first three emphases) contains a large proportion of required courses, some of them may have been completed for undergraduate credit and thus will not be repeated: electives will be used to meet the minimum 30 credits required for the degree.

Of special interest to counselors in Wisconsin in elementary and secondary schools is the Professional School Counselor Life Certificate. Requirements for this certificate are met by the completion of 18 credits beyond the Master's degree arranged in a logical program of specialization in counseling and guidance.

The following courses are available as electives to complete the Master's degree program or the above life certificate:

Testing
413-741 Individual Mental Testing 2
413-745 Assessment of Personality 2
413-750 Appraising the Individual 2
413-748 Diagnosis and Remediation of Learning Difficulties 2

Counseling
413-890 Multiple Counseling and Sensitivity Training 2
413-895 Supervision of Counselors and Counseling 2
413-705 Play Therapy 2
413-892 Advanced Counseling Practicum 2

Vocational Guidance
413-737 Curriculum and Methods in Career Education 2
413-734 Technical-Vocational Education Student 2
469-602 Principles of Vocational, Technical and Adult Education 2

Administration
413-865 Organization and Administration of Pupil Personnel Services 2
421-726 Administration 2
421-702 Principles of Supervision 2

Student Services
413-711 Introduction to Student Personnel Services 2
413-774 Supervised Internship in Student Personnel Services 6
413-749 Organization and Administration of Student Personnel Services 2

Learning Disabilities
479-562 Psychology of the Exceptional Child 2

413-647 Behavior Problems of Children 2
413-748 Diagnosis and Remediation of Learning Difficulties 2

HOME ECONOMICS — CLOTHING, TEXTILES AND RELATED ART

Master of Science Degree. The program in clothing and textiles provides an opportunity for development of professional competencies in either clothing or textiles or in both of these areas of study. It prepares students for professional positions in business, merchandising, industry, or extension services or provides concentrated study in clothing and textiles for persons planning to teach at the secondary or college level. An individualized program will be planned with the program advisor.

A program may include an emphasis in either clothing or textiles with electives chosen from an area which will support the major concentration. Programs for students planning to teach will include both clothing and textiles emphasis and courses in professional education.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

The applicant should have an undergraduate preparation of about 20 semester credits in the area of concentration; however, a general or specialized major in home economics is acceptable.

In addition to home economics majors, students from art or the physical sciences will find appropriate applications in this area.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

Preparation in Research (6-10 Cr.) Credits
421-740 Research Foundations 4
214-799 Thesis — Clothing and Textiles (or) 6
214-798 Problems in Clothing and Textiles 2

Preparation in Emphases Within Program (select one emphasis)
Emphasis in Clothing
214-580 Flat Pattern 3
214-605 European Study Tour 3-6
214-610 History of Costume: Ancient to European 1900 3
214-611 History of American Costume 2
214-617 Social-Psychological Aspects of Clothing 3
214-639 National Study Tour to Fashion Industry 1
214-655 Recent Developments in Clothing and Textiles 2
214-666 Tailoring 3
214-680 Draping 3

214-718 Clothing Today's Family 2
214-760 Seminar in Clothing and Textiles 2
214-765 Workshop in Clothing and Textiles 2
214-780 Advanced Apparel Design 3

Emphasis in Textiles
214-545 Textiles for Institutions 2
214-590 Practicum in Textile Design 3
214-592 Practicum in Textile Printing 2
214-605 European Study Tour 3-6
214-640 Textiles II 2
214-655 Recent Developments in Clothing and Textiles 2
214-690, 691, 692 Advanced Textile Design ..... 1 (ea.)
214-693 Structural Design and Weaving 2
214-695 Decorative Fabrics 2
214-740 Advanced Textiles 2
214-760 Seminar in Clothing and Textiles 2
214-765 Workshop in Clothing and Textiles 2
311-521 Textile Chemistry 3

Emphasis in Clothing and Textiles for Teaching (18-22 Cr.)
Select 14 to 18 credits from the individual emphases above, plus at least four credits from education.

Preparation for Further Individual Development (To total 30 Cr.)
Students choosing a minor emphasis in education will select a total of 14 to 18 credits from the clothing and textiles emphases, plus at least four credits from education. Students selecting a thesis will select at least 14 credits and those selecting Problems in Clothing and Textiles will select at least 18 credits from the clothing and textiles emphases.

Students may select 12 credits from either the clothing or textiles emphasis, plus a minimum of six credits in supporting work related to the program emphasis. These supporting electives may be chosen from the area of clothing and textiles not selected as the program emphases or from one of the following areas: Art, Psychology, Sociology, Economics, Management, Business, Chemistry, Administration, Communication.

HOME ECONOMICS — FOOD SCIENCE AND NUTRITION

Master of Science. The program in Food Science and Nutrition prepares students for advanced positions in teaching, dietetics, a wide range of opportunities in business and industry, and for further professional education. Individual programs must be planned in consultation with the program advisor.

ADMISSION

To be admitted to this program with full status, the applicant must have a Bachelor's degree from an accredited college, and have an overall grade point average of at least 2.75.

Students from a variety of educational backgrounds are eligible for admission. In addition to home economics majors, students from the biological, chemical, and social sciences will find appropriate applications within the program.

A deficiency in these admission requirements does not preclude admission, but may necessitate completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include the following: (a) completion of at least 30 semester hours of credit with an overall grade point average of 3.0 or better; (b) inclusion of a minimum of 15 of the 30 credits in courses open only to graduate students — 700-800 level; (c) approval of degree candidacy at the appropriate time; and (d) completion of the research and professional requirements from the lists below:

Research Preparation (6-10 Cr.) Credits
421-740 Research Foundations 4
229-770 Thesis in Food Science and Nutrition (or) 6
229-747 Problems in Food Science and Nutrition 2

Professional Preparation (14-24 Cr.)
Select 14-24 credits from one or more of the following groups:

Group A — Foods
229-638 Experimental Foods 3
229-642 Advanced Foods 2
229-661 Social and Cultural Aspects of Foods 2
229-708 Food Seminar 2
229-730 Recent Developments in Food Science 2
229-746 Modern Methods in Food Preparation 2-3
229-756 Advanced Experimental Foods 3
229-799 Independent Studies in Food Science 1
308-506 Food Microbiology 3
311-515 Food Chemistry 3
311-535 Instrumental Methods of Analysis 3

Group B — Nutrition
229-618 Diet Therapy 3
229-633 Maternal and Child Nutrition 3
229-701 Trends in Nutrition 2
229-711 Nutrition Seminar 2
229-702 Minerals and Vitamins 3
229-729 Proteins 3
229-736 Carbohydrates and Lipids 3

229-799 Independent Studies in Nutrition 1
311-535 Instrumental Methods of Analysis 3

Preparation for Further Individual Development (0-10 Cr.)

Electives are selected according to the candidate's background, interests, and objectives. Frequently, courses are chosen from other areas of home economics, or from the following fields: audio-visual communications, business administration, biology, chemistry, economics, education, English, journalism, applied mathematics, mathematics, physics, psychology, sociology, speech, vocational rehabilitation, and industrial management.

HOME ECONOMICS EDUCATION

Master of Science Degree. This program is uniquely designed for educators within two flexible tracks. One track is focused on those persons who are or who wish to become involved in education in the comprehensive program of home economics which recognizes expertise in several or all of the substantive components of home economics. One track is focused on those persons who are or who wish to become involved in education in the specialized programs in home economics which recognize expertise in one or more of the many specific substantive components of home economics.

The curriculum is individually planned to add to the competencies of elementary and secondary vocational and non-vocational teachers; vocational and university level teachers; state, district and local extension educators; supervisors, coordinators, administrators; curriculum consultants in business and industry and other educational workers related to the comprehensive or specialized components of home economics.

ADMISSION

COMPREHENSIVE PROGRAM TRACK

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75. The applicant may be admitted on probation with an overall grade point average of 2.25. This Bachelor's degree will generally have been earned in the major of home economics education. However, any of the specialized substantive areas of home economics may be appropriate. The determining factor in the choice of this track is that the applicant plans to teach or supervise in a comprehensive program of home economics upon completion of the degree program.

If the applicant has not completed specific courses in education, he may be required to complete a minimum of five credits, plus an approved student teaching experience in addition to the 30 credits required for the Master's degree. These credits may be completed concurrently with the graduate credits.

REQUIREMENTS

The requirements of this degree include completion of a minimum of 30 semester hours of graduate credit with a minimum cumulative grade point average of 3.0. Stout offers such a variety of courses in home economics and in education that these 30 credits will be individually planned with the program director within the following guidelines.

Preparation in Research (6-10 Cr.)

Professional Education (6-16 Cr.): Home Economics Education (minimum of 6 credits required); Education; Vocational Education; Psychology; and Media Technology.

Home Economics Substantive Area (6-18 Cr.): Avocational Education; Child Development; Clothing and Textiles; Consumer Education; Family Life; Foods and Nutrition; Home Equipment; Home Management; Hospitality; Housing and Related Art.

ADMISSION

SPECIALIZED PROGRAM TRACK

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75. The applicant may be admitted on probation with an overall grade point average of 2.25.

An applicant whose goals involve teaching or supervising a specialized substantive component of home economics may have a degree in any of a variety of fields. Examples of these include hotel and restaurant management; hospitality; food and lodging; food service; dietetics; fashion merchandising; clothing and textiles; early childhood; child development; family life; housing; consumer education; home management; nutrition education; and home economics education.

It is recommended that those applicants holding a degree related to business or industry should have completed a minimum of two years of work experience in the specific professional substantive area.

Because this is a program which is planned primarily to prepare educators, the applicant may be required to complete a minimum of five credits, plus an approved student teaching experience in addition to the 30 credits required for the Master's degree. These credits may be completed concurrently with the graduate credits.

REQUIREMENTS

Th requirements of this degree include completion of a minimum of 30 semester hours of graduate credit with a minimum cumulative grade point average of 3.0. Because Stout offers such a variety of courses in home economics and in education and the background and goals of persons in this track are as varied as the specializations,

these 30 credits will be individually planned with the program director within the following guidelines.

Preparation in Research (6-10 Cr.)

Professional Education (12-16 Cr.): Home Economics Education; Education; Vocational Education; Psychology; and Media Technology.

Major Substantive Area (8-12 Cr.)

INDUSTRIAL EDUCATION

Master of Science Degree. This program is especially designed for individuals with undergraduate preparation in industrial arts, American industry, industrial education, and related fields. However, it is also open to others interested in entering the industrial education field.

Specifically, the curriculum is designed to provide advanced instruction of value to: (a) secondary school industrial arts teachers, supervisors, and administrators; (b) junior college, college and university industrial arts teachers, supervisors, and administrators; (c) those desiring knowledge and competence related to American industry; (d) those who have interest in special student groups such as the disadvantaged, the slow learner, the underachiever, the handicapped and the gifted; and (e) those who desire vocational-industrial certification, but do not yet have the work experience.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree in Industrial Education (or equivalent) from an accredited college and have an overall grade point average of at least 2.75.

In addition, the applicant should have an undergraduate major in industrial arts education or its equivalent. This assumes preparation and certification (or eligibility for certification) for teaching industrial arts.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall graduate grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) approval

for degree candidacy at the appropriate time; and (c) a course distribution as outlined below:

Preparation in Research (6-10 Cr.) Credits

421-740 Research Foundations 4

The following three options are available for the research experience, each involving a research report:

190-770 Thesis — Industrial Education (or) 6
190-735 Problems in Industrial Education (or) 2
190-740 Synthesis of Problems in Industry and Technology 2

If the 190-740 option is chosen, the student should include the following courses in his program: 190-739, Introduction to Problems in Industry and Technology — to select and plan a technical problem; 1xx-798, Problems in Industry and Technology (appropriate department) — to carry out independent study, industrial visitation, and laboratory work on the problem; and 190-740, Synthesis of Problems in Industry and Technology — to draw implications of the technical work for teaching as well as preparing an oral and written report.

Preparation Basic to Program (8-10 Cr.)

190-704 History of Industrial Education 2
(At least two courses from:)
190-710 Curricular Innovations Affecting Industrial Arts 2
190-738 Course Construction in Industrial Education 2
421-738 Elementary School Curriculum 2
421-739 High School Curriculum 2
421-750 Curriculum Theory and Practice 2
190-700 Curriculum for American Industry 4
(At least one course from:)
421-700 Philosophy of Modern Education 2
479-730 Advanced Psychology of Learning 2
421-705 Social Thought of American Educators 2

Preparation in Emphases Within Program (select one emphasis)

Emphasis in Industrial Arts Education (3 Cr.)

190-739 Introduction to Problems in Industry and Technology 1
170-798 Problems in Industry and Technology 2

Emphasis in American Industry (17 Cr.)

421-714 Teaching Strategies 4
190-710 Curriculum Innovations Affecting Industrial Arts 2
190-700 Curriculum for American Industry 4
190-701 Foundations of American Industry 4
190-702 Interrelationships of American Industry Concepts 3

Emphasis in Vocational, Trade and Industrial Education (6 Cr.)

469-602 Principles of Vocational, Technical and Adult Education ... 2
421-700 Philosophy of Modern Education 2
479-730 Advanced Psychology of Learning 2

Preparation for Further Individual and Professional Development

For students planning careers in teaching, it is recommended that their technical work (graduate and undergraduate) total at least 45 semester hours. Additional electives, to total at least 30 credits, will be selected with approval of the advisor. Of the electives, many will be drawn from the following list:

100-581 Special Course (2-8 Cr.)
100-590 Technical Service Schools (1-6 Cr.)
100-710 Bases for Studying Impacts of Industry and Technology (2 Cr.)
107-504 Elementary Photography (2 Cr.)
107-605 Advanced Photography (2 Cr.)
107-645 Color Photography (2 Cr.)
107-740 Problems in Industry and Technology — Photography (2-6 Cr.)
110-547 Electronic Circuit Design (3 Cr.)
110-581 Principles of Industrial Safety (3 Cr.)
110-611 Tune Up and Diagnosis (2 Cr.)
110-614 Transmission and Drive Trains (2 Cr.)
110-615 Engine Machining and Rebuilding (3 Cr.)
110-625 Auto Shop Maintenance and Management (3 Cr.)
110-630 Aerospace (3 Cr.)
110-631 Private Pilots Ground School (3 Cr.)
110-635 Introduction to Flight (2 Cr.)
110-650 Electronic Control Systems (3 Cr.)
110-651 Feedback Control Systems (3 Cr.)
110-653 Communication Systems I (3 Cr.)
110-654 Communication Systems II (3 Cr.)
110-656 Pulse and Switching Circuit Analysis (3 Cr.)
110-660 Fluid Power Systems Design (3 Cr.)
110-702 Recent Developments in Power Technology (2 Cr.)
110-798 Problems in Industry and Technology-Energy and Transportation (2-6 Cr.)
110-797 Field Experience
110-799 Independent Studies
130-527 Topography (2 Cr.)
130-532 Machine Design Elements (3 Cr.)
130-535 Graphic Analysis and Computation (2 Cr.)
130-557 Color Separation (2 Cr.)
130-592 Mechanics of Machinery I (3 Cr.)
130-593 Mechanics of Machinery II (3 Cr.)
130-615 Industrial Design Workshop (2 Cr.)
130-629 Architectural Design III (3 Cr.)
130-636 Computer Assisted Design Problems (2 Cr.)
130-637 Product Development (2 Cr.)
130-638 Mechanical Design Problems (3 Cr.)
130-716 Seminar in Industrial Graphics (2 Cr.)
130-717 Theoretical Foundations for Technical Drawing (3 Cr.)
130-718 Recent Developments in Industrial Graphics (3 Cr.)
130-744 Operational Materials for Graphic Arts (2 Cr.)
130-798 Problems in Industry and Technology-Graphic Communications (2-6 Cr.)
130-797 Field Experience
130-799 Independent Studies
150-510 Production Processing (3 Cr.)
150-530 Human Factors Engineering (3 Cr.)
150-600 Industrial Supervision (3 Cr.)
150-610 Inventory Management (3 Cr.)
150-660 Industrial Management (2 Cr.)
150-700 Systems Analysis and Design (3 Cr.)
150-713 Introduction to Educational Systems Analysis (3 Cr.)
150-740 Introduction to Decision Theory (3 Cr.)
170-505 Tool and Machine Conditioning (2 Cr.)
170-507 Maintenance of Metal Working Equipment (2 Cr.)
170-510 Industrial Materials (4 Cr.)
170-410 Metallurgy (3 Cr.)
170-535 Tool and Die Making (2 Cr.)
170-537 Numerical Control in Manufacturing (3 Cr.)
170-550 Plastics II (2 Cr.)
170-565 Welding II (2 Cr.)
170-570 Building Construction III (2 Cr.)
170-637 Numerical Control II, Programming for Continuous Path Controls (3 Cr.)
170-713 Wood Properties I, Structure and Character (3 Cr.)
170-715 Plastics Materials and Processes (3 Cr.)
170-798 Problems in Industry and Technology—Materials and Processes (2-6 Cr.)
170-797 Field Experience
170-799 Independent Studies
190-525 Industrial Arts for Elementary Teachers (2 Cr.)
190-533 Shop Planning and Equipment Selection (2 Cr.)
190-637 School Shop Organization and Management (2 Cr.)
190-700 Curriculum for American Industry (4 Cr.)
190-701 Foundations of American Industry (4 Cr.)
190-702 Interrelationships of American Industry Concepts (3 Cr.)
190-704 History of Industrial Education (2 Cr.)
190-708 Issues in Industrial Arts (2 Cr.)
190-710 Curricular Innovations Affecting Industrial Education (2 Cr.)
190-738 Course Construction in Industrial Education (2 Cr.)
190-739 Introduction to Problems in Industry and Technology (1 Cr.)
190-740 Synthesis of Problems in Industry and Technology (2 Cr.)
190-746 Seminars in Industrial Education (2 Cr.)

OPTIONAL PROGRAMS

Persons who hold a Bachelor's degree in another field and wish to become certified to teach industrial education while also earning the Master's degree may do so by the following programs.

ADMISSION

Prior to full admission to the Master's degree program the student must develop an appropriate technical background by completion of the following **undergraduate** work. (See Undergraduate Bulletin for course descriptions.) Some graduate work may be taken concurrently.

		Credits
130-100	Communications	2
110-101	Energy	2
150-150	Industrial Organization (or)	
150-115	Structures and Concepts	2
170-101	Processes	4
130-xxx	One drafting course	2
130-xxx	One graphic arts course	2
110-xxx	One electricity course	2
110-xxx	One power course	2
170-xxx	Three materials and processes courses	6
Technical Electives		10

M.S. IN INDUSTRIAL EDUCATION — (for those certifiable for teaching in a field other than Industrial Education).
Upon completion of the undergraduate technical deficiency, students who are certifiable teachers in fields other than industrial education may enter the standard program for the Master of Science degree in industrial education outlined previously with the stipulation that their program will include at least 11 graduate credits of technical work.

M.S. IN INDUSTRIAL EDUCATION — (for those **not** certifiable for teaching in any field).

Professional Preparation (17 Cr.)

421-700 Philosophy of Modern Education 2
479-730 Advanced Psychology of Learning 2
421-714 Teaching Strategies 4
421-750 Curriculum Theory and Practice 2
190-710 Curriculum Innovation Affecting Industrial Education 2
190-738 Course Construction in Industrial Education 2
479-850 Psychology of Development 3

Teaching Practicum (8 Cr. undergraduate)

190-408 Student Teaching (or)
190-488 Intern Teaching 8
(At least 12 credits of professional preparation must be completed prior to student or intern teaching.)

Preparation in Research (6-10 Cr.)

421-740 Research Foundations 4
(See previous reference to 421-740 — Research Foundations — for options.)

Preparation Basic to Program (2 Cr.)

190-704 History of Industrial Education 2

Technical Electives (11 Cr. of which 6 may be undergraduate)
Select from technical offerings listed. See Undergraduate Bulletin for undergraduate technical courses.

INDUSTRIAL TECHNOLOGY

Master of Science Degree. This program provides educational experiences that prepare persons for positions of major responsibility at the operational management level. An operational specialty in manufacturing management is available.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

All candidates must have the equivalent of two years of appropriate industrial experience and hold a baccalaureate degree. Each candidate's educational background will be evaluated on its merits.

Persons holding industrial technology, business administration, engineering, or similar related undergraduate degrees are eligible for the program.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall graduate grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) approval for degree candidacy at the appropriate time; and (c) a course distribution as outlined below:

PROFESSIONAL FOUNDATIONS * (11 Cr.) Credits

150-700 Systems Analysis and Design (Research Concepts) 3
150-710 Seminar in Industrial Operations 3
150-720 Foundations of Industrial Operations** 2
150-740 Introduction to Decision Theory 3

*All are required courses
**A faculty tutor is assigned to guide students' self-development program. Strengths and deficiencies are identified and the student culminates the experience with both oral and written matriculation to candidacy examinations.

LEADERSHIP (minimum of 7 Cr.)

150-600 Industrial Supervision 3
150-660 Industrial Management 2
413-691 Theories of Career Development 2
479-581 Industrial Psychology 2
387-540 Sociology of Work 3
421-670 Conference Leadership 2
Other approved electives 2-4

MANUFACTURING MANAGEMENT (minimum of 9 Cr.)

150-610 Inventory Management 3
150-520 Statistical Quality Control 3
150-650 Introduction to Operations Research 3
170-537 Numerical Control in Manufacturing 3
110-581 Principles of Industrial Safety 3
110-582 Industrial Safety Programming 3
150-730 Problems in Industry and Technology — Industrial Management 2-6
150-500 Engineering Economy 3
150-510 Production Processing 3
150-530 Human Factors Engineering 3
Other approved electives 2-3

CULMINATING INTEGRATIVE EXPERIENCE

150-790 Synergistic Experience: Advanced Manufacturing Systems* 3
*All students in the program are required to take this capstone course which serves as a culminating research requirement. The student identifies an existing problem area in a cooperating industry and presents an operational solution to the problem.

SCHOOL PSYCHOLOGY

Master of Science in Education. This program leads to all three levels of certification as a school psychologist in Wisconsin. The Master's degree program provides certification at the provisional level and involves a minimum of 38 credits. A minimum of 18 additional credits leads to certification as a School Psychologist I and a total minimum of 62 credits is required for certification as School Psychologist II.

The program is designed to develop competencies in counseling, psycho-educational assessment, diagnosis and remediation, learning, psycho-social development, mental health, education and research.

ADMISSION

To be admitted with full status to this program the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

No specific undergraduate major is required for entry to the program; strength in the behavioral sciences is preferred, e.g., psychology, sociology, social work, education, child development. Appli-

cants should have at least one undergraduate course or demonstrated competence in each of the following areas: Child Psychology, Adolescent Psychology, Abnormal Psychology, Psychology of the Exceptional Child, and Learning Theory.

No specific experience or prior certification is required but work experience is desirable in related areas, e.g., teaching, guidance, social work, Vista, Peace Corps. The student should enjoy working with people of all age levels and relate well to children and adolescents as well as adults.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of the preparation in research and the requirements for certification as a provisional level school psychologist (36-42 credits) with an overall graduate grade point average of 3.0 or better and (b) approval for degree candidacy at the appropriate time.

Preparation in Research (6-10 Cr.) Credits
421-740 Research Foundations 4
413-731 Problems in Counseling and Personnel Services (or) 2
413-770 Thesis — Counseling and Personnel Services 6

Preparation Leading to Provisional Certification as a School Psychologist (32 Cr.)
479-760 Personality 2
413-741 Individual Mental Testing 2
413-501 Introduction to Guidance and Counseling 2
413-690 Aptitude and Achievement Appraisal 2
421-738 Elementary School Curriculum 2
413-xxx Seminar: School Psychological Services 2
413-743 Advanced Individual Mental Testing 2
413-675 Counseling Theory 2
413-748 Diagnosis and Remediation of Learning Difficulties 2
413-790 Supervised Counseling Practicum 4
413-681 Psychology of Reading 2
413-752 Group Dynamics 2
413-745 Assessment of Personality (Projectives) 2
413-795 Clinical Practice in Educational Diagnosis I 2
413-748 Advanced Diagnosis and Remediation of Learning Difficulties 2

PREPARATION FOR CERTIFICATION AS SCHOOL PSYCHOLOGIST I (16 Cr.)
In addition to the requirements for the Master's degree, the student seeking certification as a School Psychologist I must complete the following:
459-585 Mental Retardation and Behavioral Disabilities 2
421-700 Philosophy of Modern Education (or)
421-705 Social Thought of American Educators 2

413-705 Play Therapy 2
413-xxx Behavior Modification 2
413-647 Behavior Problems of Children 2
413-795 Clinical Practice in Educational Diagnosis II 2
413-xxx Clinical Practice in School Psychological Services 4

PREPARATION FOR CERTIFICATION AS SCHOOL PSYCHOLOGIST II
To achieve certification as a School Psychologist II, a student holding certification as School Psychologist I must complete additional appropriate work to total 62 credits (including the above requirements for the Master's degree and certification at the provisional and School Psychologist I levels). Included in the program will be:
413-xxx Seminar: Issues and Trends in School Psychological Services 2
413-796 Internship in School Psychology 2-8
(May be waived for candidates with sufficient appropriate experience.)

Electives to total 62 credits selected from:
413-629 Guidance in the Elementary School 2
413-655 Human Relations in the Community 2
413-892 Advanced Counseling Practicum 2
413-799 Independent Study 2
413-890 Multiple Counseling and Sensitivity Training 2
413-895 Supervision of Counselors and Counseling 2
479-850 Psychology of Development 2
421-630 Educating Children with Special Learning Needs 2
421-596 Mental Health in the Schools 2
479-730 Advanced Psychology of Learning 2
413-691 Theories of Career Development 2
Selected courses in Child Development or Vocational Rehabilitation.

VOCATIONAL EDUCATION

Master of Science Degree. The graduate program in Vocational Education is designed to increase the professional competence of those who plan to serve in a high school or post high school program as a teacher, coordinating teacher, coordinator, supervisor, local vocational education coordinator, or administrator of vocational education.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75.

Applicants with undergraduate degrees and certification in the various subject areas of vocational-technical education are generally eligible.

Applicants with appropriate subject matter backgrounds but who

do not have the required professional education will need to complete, for undergraduate credit, at least one appropriate methods course. This should be completed early in the program.

Applicants for the emphasis in local vocational education coordinator (LVEC) must complete, for undergraduate credit, a course in the principles, issues, and/or philosophy of vocational-technical education.

Prior to award of the degree, the student must present evidence of the necessary amount and kind of occupational experience as specified by the appropriate state certifying agency.

A deficiency in these admission requirements does not preclude admission, but it may require completion of additional undergraduate work and/or increase the amount of graduate credit required to earn the degree.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall graduate grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) approval for degree candidacy at the appropriate time; and (c) a course distribution as outlined below:

Preparation in Research (6-10 Cr.) Credits

421-740 Research Foundations 4
469-736 Problems in Vocational Education (or) 2
469-770 Thesis — Vocational Education (or) 6
190-740 Synthesis of Problems in Industry and Technology (teaching emphasis only) 2
(note prerequisite) (or)
469-784 Internship — LVEC (for LVEC only) 4-8

Preparation in Emphases within Program (select one emphasis)

Emphasis in Teaching (6 Cr.)

469-602 Principles of Vocational, Technical and Adult Education ... 2
421-700 Philosophy of Modern Education 2
479-730 Advanced Psychology of Learning 2

Emphasis in Administration (6 Cr.)

421-700 Philosophy of Modern Education 2
469-602 Principles of Vocational, Technical and Adult Education.... 2
479-730 Advanced Psychology of Learning 2

Emphasis in Local Vocational Education Coordination — (LVEC) (18-26 Cr.)

This emphasis is the certification program for Local Vocational Education Coordinators in Wisconsin; similar positions exist in other states.

421-679 Public Relations 2
421-702 Principles of Supervision 2
421-726 Administration 2
421-733 Survey Procedures 2
413-690 Aptitude and Achievement Appraisal (or) 2
413-737 Curriculum and Methods in Group Guidance 2

469-560 Cooperative Occupational Education Programs 2
413-691 Theories of Career Development (or) 2
459-717 Occupational Analysis and Information 2
413-734 Technical-Vocational Education Student 2
421-750 Curriculum Theory and Practice 2

Preparation for Further Individual and Professional Development

The student should confer with the program advisor in choosing the elective credits to complete the 30 hour degree requirements. There is considerable flexibility in the program with regard to electives and they may be taken as needed to fulfill the individual goals and objectives of the student. Generally, electives may be chosen from among the following courses.

100-510 Bases for Studying the Impacts of Industry and Technology 2
311-551 Chemistry of Industry I 4
320-610 Contemporary American Economic Problems 3
326-516 Technical Writing in Industry 3
354-741 Digital Computer Programming 2
372-705 Classical Physics in Industry 3
387-540 Sociology of Work 3
387-590 Sociological Theory 3
391-512 Speech Skills for Educators 2
407-560 Audio-Visual Communication 2
413-501 Introduction to Guidance and Counseling 2
421-705 Social Thought of American Educators 2
421-714 Teaching Strategies 4
421-541 Education Evaluation 2
421-733 Survey Procedures 2
421-739 High School Curriculum 2
421-750 Curriculum Theory and Practice 2
320-720 Labor and Industrial Relations 2
150-513 Introduction to Educational Systems Analysis 3
469-534 Task Analysis 2
469-608 Issues in Vocational, Technical and Adult Education 2
421-670 Conference Leading 2
421-679 Public Relations 2
421-681 American Higher Education 2
421-702 Principles of Supervision 2
421-726 Administration 2
469-560 Cooperative Occupational Education Programs 2
469-710 Coordination 2
469-792 Administration of Vocational, Technical and Adult Education 2
469-773 Problems in Coordination 2
469-746 Seminars in Vocational Education 2

Persons preparing to teach will select advanced courses in their subject field. This bulletin lists some graduate level technical courses, but a great variety of 400-500 level (graduate-undergraduate) courses listed in the Undergraduate Bulletin are available for graduate credit in certain individual situations. Students are urged to investigate advanced subject matter courses suitable to their particular teaching field; in some teaching areas it may be desirable to transfer them from another institution. However, prior approval to take any course should be obtained.

VOCATIONAL REHABILITATION — WORK EVALUATION*

Master of Science Degree. This program is designed to develop specific and general competencies required of specialists in the area of work evaluation. The Master of Science degree program may be completed in nine to 12 months, (30-40 credits) depending upon the qualifications and competencies of the student. The course schedule is designed to meet the individual needs of the student and courses may be waived if the student can demonstrate the skills and knowledges the course is designed to develop.

ADMISSION

To be admitted with full status to this program, the applicant must hold a Bachelor's degree from an accredited college and have an overall grade point average of at least 2.75. Applicants may be admitted on probationary stauts if their overall grade point average is at least 2.25 but less than 2.75. Applicants who have less than a 2.25 overall grade point average but have relevant work experience since receiving their Bachelor's degree may qualify for admission by taking a full credit load of selected undergraduate courses during the summer session or regular semester and attaining a 3.0 grade point average. All applicants must present evidence that they are familiar with the practices in American industry and business. (Applicants from a foreign country may meet this requirement by presenting evidence of two years of paid work experience in American industry or business.)

Further, the applicant should possess personal characteristics necessary to work with handicapped people — personal and social maturity, a combination of patience, empathy, and understanding, and an interest in the welfare of handicapped individuals.

It is recommended that the applicant have an undergraduate degree with major emphasis in vocational rehabilitation, industrial education, industrial technology, home economics, occupational therapy, psychology or sociology, or a closely related field. Applicants with deficiencies may be required to take additional undergraduate or graduate courses prior to attaining full status in the program.

REQUIREMENTS

The requirements for this degree include: (a) completion of at least 30 semester hours of graduate credit with an overall grade point average of 3.0 or better; a minimum of 15 credits must be in courses open only to graduate students — 700-800 level; (b) a minimum grade of B or better in practicum and internship courses; (c) approval for degree candidacy at the appropriate time; and (d) a course distribution as outlined below.

Preparation in Research (6-10 Credits) Credits

421-740	Research Foundations	4
459-755	Problems in Vocational Rehabilitation (or)	2
459-770	Thesis in Vocational Rehabilitation	6

Preparation Basic to Program

459-503	Physical Disability and Work	3
459-706	Practicum in Work Evaluation	2
459-707	Practicum in Work Evaluation	4
459-717	Occupational Analysis and Information	2
459-723	Procedures of Work Evaluation	2
459-738	Psychological Disability and Work	3
459-761	Counseling Techniques	2
459-780	Administration in Work Evaluation	2
459-783	Internship in Work Evaluation	4-6-8
413-690	Aptitude and Achievement Appraisal	2
459-585	Mental Retardation and Behavioral Disabilities	2

Preparation for Further Individual and Professional Development

459-700	Seminar in Vocational Rehabilitation	1-2
459-701	Introduction to Vocational Rehabilitation	2
459-724	Procedures of Work Adjustment	2
459-799	Independent Studies in Vocational Rehabilitation	1-2
413-741	Individual Mental Testing	2
413-743	Advanced Individual Mental Testing	2
459-505	Communication with Deaf	3

*Rehabilitation counselors employed by the Wisconsin Division of Vocational Rehabilitation may elect an emphasis in rehabilitation counseling, rather than work evaluation.

EDUCATION SPECIALIST DEGREE GUIDANCE AND COUNSELING

The Education Specialist degree in Guidance and Counseling is an advanced degree requiring 36 semester credits beyond the Master's degree.

The program is for people who have a Master's degree in Guidance and Counseling or an equivalent field. It is designed to enable the student to develop beyond the Master's degree level those competencies required in the broad area of guidance and counseling.

The program includes the appropriate courses needed for Life Certification for school counselors in Wisconsin (18 semester credits beyond the Master's degree).

Persons eligible for the Wisconsin 30 credit Professional School Counselor Certification plan who have Master's degrees in other fields are eligible for this program.

ADMISSION

Students seeking admission to the program should complete the following at least 30 days prior to the opening of the term in which they plan to begin their program.

1. File an application for admission to the Ed.S. program.

2. Submit a current dossier listing all pertinent biographical and educational data.
3. Complete the general aptitude test of the Graduate Record Examination (GRE) with a total score of at least 900. (Students who have previously submitted such scores need not do so again.)
4. Present official transcripts of all college and university work completed certifying award of Bachelor's and Master's degrees. Master's degree work must be in Guidance and Counseling or an equivalent field with a cumulative grade point average of at least 3.25 on a 4.0 scale in all graduate work. Transcripts need not be submitted for work completed at Stout.
5. Provide evidence of at least two years of successful teaching experience and professional promise by requesting letters from at least two administrators or supervisors.

After review of the application data, the Graduate College will:

1. Assign the student program status and inform him of it immediately.
   a. Full status will be granted to those who meet all admission requirements.
   b. Provisional status may be granted to those who do not fully qualify on some requirements. At the conclusion of the first term of enrollment, the status will be re-evaluated.
   c. Admission will be denied students whose qualifications do not meet the requirements and if the admissions committee decides provisional status is not warranted.
2. Assign an advisor to assist in developing a degree program and registering for the first term.

DEGREE PROGRAM SUPERVISION

For the first enrollment, the student's program advisor will aid him in developing a class schedule in keeping with degree requirements. Prior to enrolling for a second term, the student will prepare a total program plan in keeping with degree requirements and his special needs.

At that time, the Graduate College will appoint a supervisory committee consisting of his program advisor and two other members of the graduate faculty. The committee will act on the appropriateness of the student's degree program, approve his proposed field, administer his oral comprehensive examination and recommend the award of the degree.

PROFESSIONAL EXPERIENCE

This program is designed for people in guidance and counseling types of positions who have had a minimum of two years of professional experience. Thus, no more than eight credits in the degree program may be completed prior to satisfying the requirement of two years of successful professional experience.

REQUIREMENTS FOR AWARD OF THE ED.S. DEGREE

Prior to the award of the Ed.S. degree, the following requirements will be met.

1. Completion of an approved degree program with an overall grade point average of at least 3.25.
2. Filing of an "Intent to Graduate" at least seven weeks prior to the expected graduation date.
3. Completion of a comprehensive examination, written and oral, at least three weeks prior to graduation.
4. Filing of an approved field study report and abstract at least one week prior to graduation.
5. Recommendation for the degree by the supervisory committee.

TRANSFER OF CREDIT

A maximum of 15 semester hours of graduate credit may be transferred to meet the requirements of the Ed.S. degree. It must be appropriate to the degree program and awarded by an institution accredited for graduate level work. All credit to be counted towards the degree must have been completed within seven years of the date the degree is awarded. Credits earned through Stout's Continuing Education program are considered transfer credit for this purpose.

RESIDENCE REQUIREMENTS

Candidates for the Ed.S. degree must be full-time on-campus students for at least two consecutive summer sessions (minimum of six credits per summer) or one semester (minimum of 12 credits).

TIME LIMITS

All degree requirements, including transferred credit, must be completed within a seven-year period.

CURRICULUM

Content for the advanced degree program will be drawn from three bodies of knowledge: Foundations, Research, and Professional Study. Selection of these three components is based on the assumption that the holder of an advanced degree should be a practicing professional, capable of solving problems through applied research techniques, and a scholar in his profession.

The three components are shown below with a listing of the required courses for the program. The 700 level numbered courses are open to all graduate students. The 800 numbered courses are for the Education Specialist degree program students only.

PROGRAM PLAN

To qualify for the degree of Education Specialist, the student must earn not less than 36 semester credits beyond the Master's degree which will be distributed as follows: Selectives will be planned with the program advisor to insure the most appropriate program for each student.

Foundations (10 Cr.)		Credits
421-700	Philosophy of Modern Education (or)	
421-705	Social Thought of American Educators	2
320-610	Contemporary American Economics Problems	3
387-710	Sociological Foundations of Guidance	3
479-730	Advanced Psychology of Learning	2

Research (4 Cr.)	
Selectives (Beyond 421-740, Research Foundations, or equivalent)	4

Professional (22 Cr.)		
413-735	Information Service and Vocational Guidance	2
413-892	Advanced Counseling Practicum	2
413-800	Field Study	6
Selectives		12

EDUCATION SPECIALIST DEGREE INDUSTRIAL AND VOCATIONAL EDUCATION

Two emphases of study are available leading to an Education Specialist degree in Industrial and Vocational Education.

The program is for those who have a Master's degree in industrial arts, industrial education, vocational education or equivalent. (Equivalency meaning agriculture, business education, distributive education, home economics education, and trade and industrial education.)

Or, the program is for those who have a Master's degree and are a certified employee of a vocational-technical institute or a community college.

ADMISSION

Students seeking admission to the program should complete the following at least 30 days prior to the opening of the term in which they plan to begin their program.

1. File an application for admission to the Ed.S. program.
2. Submit a current dossier listing all pertinent biographical and educational data.
3. Complete the general aptitude test of the Graduate Record Examination (GRE) with a total score of at least 900. (Students who have previously submitted such scores need not do so again).

4. Present official transcripts of all college and university work completed certifying award of Bachelor's and Master's degrees in industrial education, industrial arts education, vocational education, or an equivalent field with a cumulative grade point average of at least 3.25 on a four-point scale in all **graduate** work. Persons having Master's degrees in other fields who are certified and employed in supervisory positions in vocational-technical education are also eligible for admission. Transcripts need not be submitted for work completed at Stout.
5. Provide evidence of at least two years of successful teaching experience and professional promise by requesting letters from at least two administrators or supervisors.

After review of the application data, the Graduate College will:

1. Assign the student program status and inform him of it immediately.
   a. **Full status** will be granted to those who meet all admission requirements.
   b. **Provisional status** may be granted to those who do not fully qualify on some requirements. At the conclusion of the first term of enrollment, the status will be re-evaluated.
   c. Admission will be **denied** students whose qualifications do not meet the requirements and if the admissions committee decides provisional status is not warranted.
2. Assign an advisor to assist in developing a degree program and registering for the first term.

DEGREE PROGRAM SUPERVISION

For the first enrollment, the student's program advisor will aid him in developing a class schedule in keeping with degree requirements. Prior to enrolling for a second term, the student will prepare a total program plan in keeping with degree requirements and his special needs.

At that time, the Graduate College will appoint a supervisory committee consisting of his program advisor and two other members of the graduate faculty.

The committee will act on the appropriateness of the student's degree program, approve his proposed field study, administer his oral comprehensive examination and recommend the award of the degree.

TEACHING EXPERIENCE

This program is designed for people in education. It is felt that coursework will be more significant for those who have some experience in teaching. Thus, no more than eight credits in the degree program may be completed prior to satisfying the requirement of two years of successful teaching experience.

REQUIREMENTS FOR AWARD OF THE ED.S. DEGREE

Prior to the award of the Ed.S. degree, the following requirements will be met.

1. Completion of an approved degree program with an overall grade point average of at least 3.25.
2. Filing of an "Intent to Graduate" at least seven weeks prior to the expected graduation date.

3. Completion of a comprehensive examination, written and oral, at least three weeks prior to graduation.
4. Filing of an approved field study report and abstract at least one week prior to graduation.
5. Recommendation for the degree by the supervisory committee.

TRANSFER OF CREDIT

A maximum of 18 semester hours of graduate credit may be transferred to meet the requirements of the Ed.S. degree. It must be appropriate to the degree program and awarded by an institution accredited for graduate level work. All credit to be counted toward the degree must have been completed within seven years of the date the degree is awarded. Credits earned through Stout's Continuing Education office are considered transfer credit for this purpose.

RESIDENCE REQUIREMENTS

Candidates for the Ed.S. degree must be full-time on-campus students for at least two consecutive summer sessions (minimum of six credits per summer) or one semester (minimum of 12 credits).

TIME LIMITS

All degree requirements, including transferred credit, must be completed within a seven-year period.

INDUSTRY AND TECHNOLOGY EMPHASIS

The Education Specialist degree program in Industrial and Vocational Education — Teaching Emphasis at Stout is designed for the graduate student desiring a broad educational experience leading to a professional career as a teacher of industrial and technical subjects in high schools, vocational schools, technical institutes, junior colleges, and universities.

Content for the advanced degree program will be drawn from three bodies of knowledge: (a) industry and technology, (b) applied research, and (c) professional education. Selection of these three components is based on the assumption that the holder of an advanced degree in industrial education should be a scholar in his discipline (industry and technology), capable of solution of problems through applied research techniques (researcher), and a practicing educator.

CURRICULUM

The Ed.S. degree curriculum consists of three groups of courses and/or experiences as follows: Industry and Technology, Applied Research, and Professional Education.

The industry and technology component consists of courses basic to the science of industry and technology and a field study. This component is intended to be flexible in order to afford the candidate an opportunity to broaden himself, if his prior work has been narrow or to study in depth a particular conceptual area of industry and technology if his prior work has been broad in nature. In this component

the advanced graduate student will have the opportunity to take additional physics, chemistry, mathematics, sociology, psychology and coursework to develop a level of competence in one or two conceptual areas in his substantive teaching field. The impacts of industry and technology, a course required of all students in the program, permits the student to look at how his teaching area has had an effect on man and society. The culminating activity is a field study which is six semester credits of the 18 semester credits required in this component. The field study is concerned with structuring the body of knowledge related to one's substantive area of teaching; developing an instructional unit to develop a particular concept or sub-concept; and field test the instructional unit to validate its content and criterion measures to determine if the student is able to generalize about the concept or sub-concept.

The applied research component consists of coursework in computer science, research design and procedures, and statistics. A holder of an advanced degree should have an intimate knowledge of research design, measurement and statistics, and a broad background in the problems associated with industrial and vocational education.

The professional education component consists of courses in the foundational areas of education and curriculum and instruction. There is a growing body of knowledge and research dealing with education and the instructional process. It is imperative that the Education Specialist be able to implement current innovative educational practices and thought into the curriculum and the teaching process.

The three components are shown below as they appear in the curriculum requirements for the degree.

PROGRAM PLAN

To qualify for the degree of Education Specialist — Industrial and Vocational Education requires that the student earn not less than 36 semester credits beyond the Master's degree which will be distributed as follows:

		Sem. Hrs.	Sem. Hrs.
Industry and Technology			16-20
Required:			
100-710	Bases for Studying the Impacts of Industry and Technology	2	
100-890	Field Study in Industry and Technology	6	
Selectives		8-12	
Applied Research			6-10
Required:			
354-741	Computer Programming Techniques	2	
421-816	Instrumentation for Research	3	
Selectives		0-4	
Professional Education			6-10
Required:			
479-850	Psychology of Development	3	
421-811	Structuring Knowledge	2	
Selectives		1-5	

I. INDUSTRY AND TECHNOLOGY

A. Sciences Basic to Industry and Technology

1. Chemistry

311-551	Chemistry of Industry	4
311-552	Chemistry of Industry	2
311-561	Industrial Organic Chemistry	3

2. Economics

320-610	Contemporary American Economic Problems	3
320-615	Contemporary International Economic Problems	3
320-720	Labor and Industrial Relations	2

3. Physics

372-705	Classical Physics in Industry	3
372-706	Modern Physics in Industry	3

4. Sociology

387-525	Sociology of Leisure	3
387-540	Sociology of Work	3
387-560	Juvenile Delinquency	3
387-575	Sociology of Minority Groups	3
387-590	Sociological Theory	3

5. Speech

391-508	Speech Skills for Business and Industry	2
391-512	Speech Skills for Educators	2

6. Psychology

479-850	Psychology of Development	3

B. Science of Industry and Technology

1. Interdepartmental

100-710	Industrial Materials	4
100-890	Field Study in Industry and Technology	6

2. Energy and Transportation

110-256	Digital Computer Systems	3
110-341	Basic Intrumentation and Control	2
110-342	Electronic Communication	2
110-345	Network Analysis	3
110-353	Information Theory	3
110-547	Electronic Circuit Design	3
110-611	Tune Up and Diagnosis	2
110-614	Transmission and Drive Trains	2
110-650	Electronic Control Systems	3
110-651	Feedback Control Systems	3
110-653	Communication Systems I	3
110-654	Communication Systems II	3
110-656	Pulse and Switching Circuit Analysis	3
110-660	Fluid Power Systems Design	3
110-702	Recent Developments in Power Technology	2
110-798	Problems in Industry and Technology — Energy and Transportation	2-6

3. Graphic Communications

130-467	Relief and Screen Process	2
130-475	Printing Economics	2
130-535	Graphic Analysis and Computation	2
130-557	Color Separation	2
130-615	Industrial Design Workshop	2
130-629	Architectural Design III	2
130-636	Computer Assisted Design Problems	2
130-637	Product Development	2
130-638	Mechanical Design Problems	3
130-716	Seminar in Industrial Graphics	2
130-717	Theoretical Foundations for Technical Drawing	3
130-718	Recent Developments in Industrial Graphics	3
130-744	Operational Materials for Graphic Arts	2
130-798	Problems in Industry and Technology — Graphic Communications	2-6

4. Industrial Management

150-402	Physical Facilities	2
150-417	Finance and Procurement in Industry	2

5. Materials and Processes

170-410	Metallurgy	2
170-453	Plastics Mold Making	2
170-465	Welding II	2
170-505	Tool and Machine Conditioning	2
170-507	Maintenance of Metalworking Equipment	2
170-535	Tool and Die Making	2
170-550	Plastics II	2
170-637	Numerical Control II, Programming for Continuous Path Controls	3
170-713	Wood Properties I: Structure and Characteristics	3
170-715	Plastics Materials and Processes	3
170-798	Problems in Industry and Technology — Materials and Processes	2-6

6. Industrial Teacher Education

190-739	Introduction to Problems of Industry and Technology	1

C. Impacts of Industry and Technology

100-710	Bases for Studying the Impacts of Industry and Technology	2

II. APPLIED RESEARCH

A. Research Design and Procedures

421-841	Basic Research Design	3

421-816 Instrumentation for Research 3

B. Computer Science

354-741 Computer Programming Techniques 2

C. Statistics

421-761 Educational Statistics 2
421-862 Inferential Statistics 3
421-863 Sampling Techniques 3

III. PROFESSIONAL EDUCATION

A. Foundations

1. Education

421-505 History of Education 2
421-700 Philosophy of Modern Education 2
421-705 Social Thought of American Educators 2

2. Psychology

479-730 Advanced Psychology of Learning 2
479-850 Psychology of Development 3

B. Curriculum and Instruction

1. Audio-Visual

407-732 Planning Media Facilities 2
407-747 Communication Media Design 2
407-751 Programmed Instruction 2

2. Counseling and Guidance

413-734 The Technical-Vocational Education Student 2

3. Education

421-714 Teaching Strategies 4
421-811 Structuring Knowledge 2
421-750 Curriculum Theory and Practice 2

4. Industrial Teacher Education

190-708 Issues in Industrial Arts 2
190-710 Curricular Innovations Affecting Industrial Education 2
190-738 Course Construction in Industrial Education 2

5. Vocational Education

469-608 Issues in Vocational, Technical and Adult Education 2
469-534 Task Analysis 2
469-674 Adult Education 2
469-710 Coordination 2
469-715 Technical Education Programs 2
469-773 Problems in Coordination 2
469-799 Independent Study 2

C. Supervision and Administration

1. Industrial Management

150-650 Introduction to Operations Research 3
150-713 Introduction to Educational Systems Analysis 3

2. Education

421-679 Public Relations 2
421-702 Principles of Supervision 2
421-726 Administration 2
421-727 Supervision of Student Teachers 2

3. Vocational Education

469-792 Administration of Vocational, Technical and Adult Education 2

PROFESSIONAL EDUCATION EMPHASIS

This emphasis of the Education Specialist degree in Industrial and Vocational Education has been designed to further the individual who has committed himself to additional depth in his preparation as a professional educator in the areas of curriculum and instruction and the supervision of instruction.

Content for the advanced degree program will be drawn from three bodies of knowledge: (a) professional education, (b) applied research, and (c) industry and technology. Selection of these three components is based on the assumption that the holder of an advanced degree should be a practicing educator, capable of solving problems through applied research techniques, and a scholar in his discipline.

CURRICULUM

The curriculum consists of three groups of courses and/or experiences as follows: Professional Education (Curriculum and Instruction and the Supervision of Instruction), Applied Research, and Industry and Technology.

The professional education component has two sub-components: curriculum and instruction and the supervision of instruction.

Curriculum and instruction involves the advanced graduate student in curriculum engineering, instructional systems, instructional strategies, structuring knowledge, principles of learning, guidance of learning activities, identification and determination of instructional content, and computer assisted instruction as related to Industrial and Vocational Education.

Supervision of instruction involves policy developments, program planning budget systems, cost analysis, cost effectiveness, program evaluation review techniques, accountability in education, decision making models, evaluation systems, improvement of instruction, financial aspects, coordination, leadership procedures, economics in education, management information systems, and management techniques as related to Industrial and Vocational Education. The culminating activity is a field study which is six semester credits of the total (16-20 credits) in this component. The field study provides one the opportunity to put into practice some aspect of the program that will benefit him and the institutional setting where he is employed or aspires to be employed.

The applied research component consists of coursework in management information systems, instrumentation for research and man-

power research and planning. A holder of an advanced degree should have knowledge of research design, measurement and statistics and an understanding of problems associated with industrial and vocational education.

The industry and technology component consists of courses in the sciences basic to industry and technology (math, computer science, sociology, psychology, communication, and economics) and the impacts of industry and technology on man and society. The three components are shown below with a listing of the required courses for the program.

PROGRAM PLAN

To qualify for the degree of Education Specialist, requires that the student earn not less than 36 semester credits beyond the Master's degree which will be distributed as follows:

	Sem. Hrs.	Sem. Hrs.
Professional Education		16-20
Required:		
421-890 Field Study	6	
421-811 Structuring Knowledge	2	
Selectives	8-12	
Applied Research		6-10
Required:		
421-816 Instrumentation for Research	3	
Selectives	3-7	
Industry and Technology		6-10
Required:		
100-710 Bases for Studying the Impacts of Industry and Technology	2	
479-850 Psychology of Development	3	
Selectives	1-5	

I. PROFESSIONAL EDUCATION

A. Foundations

421-505 History of Education	2
421-700 Philosophy of Modern Education	2
421-705 Social Thought of American Educators	2
479-730 Advanced Educational Psychology	3

B. Curriculum and Instruction

1. Audio-Visual

407-732 Planning Media Facilities	2
407-747 Communication Media Design	2
407-751 Programmed Instruction	2

2. Guidance

413-691 Theories of Career Development	2
413-734 The Technical-Vocational Education Student	2
413-750 Appraising the Individual	2
413-752 Group Guidance Procedures	2
413-890 Sensitivity Training	2

3. Education

421-890 Field Study	6
421-714 Teaching Strategies	4
421-750 Curriculum Theory and Practice	2
413-752 Group Dynamics	2
421-799 Independent Study	2
421-811 Structuring Knowledge	2

4. Industrial Teacher Education

190-708 Issues in Industrial Arts	2
190-710 Curricular Innovations Affecting Industrial Education	2
190-738 Course Construction in Industrial Education	2

5. Vocational Education

469-534 Task Analysis	2
469-560 Cooperative Occupational Education Programs	2
469-608 Issues in Vocational, Technical and Adult Education	2
469-674 Adult Education	2
469-710 Coordination	2
469-715 Technical Education Programs	2
469-746 Seminar in Vocational Education	2
469-773 Problems in Coordination	2
469-799 Independent Study	2

6. Vocational Rehabilitation

459-717 Occupational Analysis and Information	2

C. Supervision and Administration

1. Education

150-713 Introduction to Educational Systems Analysis	3
421-890 Field Study	6
421-679 Public Relations	2
421-702 Principles of Supervision	2
421-726 Administration	2
421-727 Supervision of Student Teachers	2
413-749 Organization and Administration of Student Personnel Services	2
320-770 Economics in Education	4

2. Vocational Education

469-792 Administration of Vocational-Technical and Adult Education	2
469-784 Internship — Local Vocational Education Coordinator (LVEC)	4-8

II. APPLIED RESEARCH

A. Research Design and Procedures

421-733 Survey Procedures (Manpower Planning Analysis)	2
421-841 Basic Research Design	3
421-816 Instrumentation for Research	3

B. Statistics

421-761	Educational Statistics	2
421-862	Inferential Statistics	3
421-863	Sampling Techniques	3

III. INDUSTRY AND TECHNOLOGY

A. Economics

320-610	Contemporary American Economic Problems	3
320-720	Labor and Industrial Relations	2

B. Sociology

387-525	Sociology of Leisure	3
387-540	Sociology of Work	3
387-560	Juvenile Delinquency	3
387-575	Sociology of Minority Group	3
387-590	Sociological Theory	3

C. Speech

391-508	Speech Skills for Business and Industry	2
391-512	Speech Skills for Educators	2

D. Psychology

479-850	Psychology of Development	3

E. American Industry

190-700	Curriculum for American Industry	4
190-701	Foundations of American Industry	4

F. Selected Technical Courses (as listed under the Industry and Technology Emphasis) 2-3

COURSE DESCRIPTIONS

INDUSTRY AND TECHNOLOGY

100-710 Bases for Studying the Impacts of Industry and Technology (100-510). 2 Cr. A contemporary, historical and futuristic look at some of the economic, sociological, psychological and political implications of industry and technology. Students will identify and investigate several impacts of industry and/or technology to show depth of understanding and relationships between them.

100-890 Field Study in Industry and Technology (100-690). 6 Cr. A study which provides the graduate student with the opportunity to: (1) explore in depth the body of knowledge associated with his substantive teaching field in industry and technology, (2) provide an educational experience for implementing this knowledge into the classroom situation, and (3) devise methods to determine if this methodology has brought about desired behavioral changes.

107-501 Elementary Photography (107-401). 2 Cr. Fundamentals of photography including aesthetics, basic theory, camera operation, film selection, lighting, roll film processing, contact printing, enlarging and print finishing. Student must provide his own camera.

107-605 Advanced Photography (107-405). 2 Cr. Advanced monochromatic photography including aesthetics, advanced theory, view camera techniques, studio lighting, selection of photographic materials and equipment, sheet film processing, specialized processes and techniques.

107-645 Color Photography (107-445). 2 Cr. Includes aesthetics, color theory, film selection, lighting, copy techniques, slide duplication, reversal and negative color film processing, and color printing.

107-740 Problems in Industry and Technology-Photography (107-540). 2-6 Cr. Substantive study and activity for specialists in the photography field to include library work, field observation, laboratory work planned by the student and approved and supervised by a faculty consultant in photography. Preparation of a technical report may be repeated for a maximum of six semester credits. Prerequisite: 190-740.

110-547 Electronic Circuit Design (124-476). 3 Cr. An analytical study of electronic circuit design, the philosophy of circuit design, general design procedures, DC and low frequency design, high frequency design, digital circuit design, switching circuit design, power supply, analog computer circuit design, and the circuit evaluation techniques. Some laboratory work is required.

110-577 Driver Improvement Programs (182-453). 2 Cr. The improvement of drivers through educational methodolgy, curriculum planning, and research. Special attention given to adult programs, mentally retarded, orthopedically handicapped, as well as the chronic violator and the accident repeater. Prerequisite: Six semester hours of course work in Safety Studies.

110-578 Traffic and Highway Safety Programs (182-455). 3 Cr. An overview of the traffic and highway safety problems; components; research agencies; national, state and local policies; standards and recommendations for improved traffic safety.

110-581 Principles of Industrial Safety (182-460). 3 Cr. An overview of occupational accident prevention programs. Emphasis on techniques of measurement, cost of accidents, locating and identifying accident sources, psychology of occupational safety and problems of selecting corrective action.

110-582 Industrial Safety Programming (182-464). 3 Cr. In-depth study of current administrative, organizational, and supervisory practices which are specifically and uniquely related to managing the operational industrial or occupational accident prevention program.

110-611 Tune Up and Diagnosis (176-468). 2 Cr. Practicum in automotive tune-up and diagnostic service procedures; service operations with all types of modern automotive test equipment.

110-614 Transmission and Drive Trains (176-456). 2 Cr. Power transmission through gears, clutches and drives common to the automobiles. Fluid couplings, gear sets, differentials, transmissions and drive lines.

110-615 Engine Machining and Rebuilding (176-462). 3 Cr. The rebuilding of four-stroke cycle engines including all necessary precision machining. Special emphasis given to cylinders, blocks, valve trains, and reciprocating parts.

110-625 Auto Shop Maintenance and Management (176-445). 3 Cr. Maintenance and management of equipment and personnel peculiar to the auto shop.

110-630 Aerospace (176-400). 3 Cr. Classroom, field and optional flight experiences for educators who wish a better understanding of today's aviation or aerospace industries, details of space exploration, federal licensing regulations, air traffic control, and related career guidance information.

110-631 Private Pilot's Ground School (176-440). 3 Cr. Prepares the beginning flight student for an F.A.A. Private Pilot's Certificate through the study of airplane utility, flight manuals, safety, federal aviation regulations, navigation, communication, weather, general operation of aircraft and flight theory.

110-635 Introduction to Flight (176-480). 2 Cr. Development of skills and knowledge of flying a single engine aircraft. Instruction includes applied flight theory, dual flight instruction and solo flight.

110-650 Electronic Control Systems (124-454). 3 Cr. General electronic control systems, sensing devices, control devices, sequence control, basic feedback control principles, analog computation and control, and numerical controls. Laboratory work is required.

110-651 Feedback Control Systems (124-458). 3 Cr. Models and equations of linear system, feedback control components, general theory, response of feedback systems, the Nyquist criterion, Bode plot analysis, polar plots, frequency response, root-loci techniques, and nonlinear system analysis. Laboratory work is required.

110-653 Communication Systems I (124-444). 3 Cr. An analytical study of communication transmission and receiving systems, the circuits and design techniques of systems, signal transmission systems, signal receiving systems, and applied techniques. Laboratory work is required.

110-654 Communication Systems II (124-446). 3 Cr. An analytical study of antenna systems, electromagnetic field theory, low frequency antenna, high frequency antenna theory and design, radio frequency transmission lines and graphical synthesis of impedance matching networks. Laboratory work is required.

110-656 Pulse and Switching Circuit Analysis (124-464). 3 Cr. An analytical study of electronic circuit design, philosophy of circuit design, general design procedures, C.C. and low frequency design, high frequency design, digital circuit design, switching circuit design, power supply, analog computer design, and circuit evaluation techniques. Laboratory work is required.

110-660 Fluid Power Systems Design (176-426). 3 Cr. Introduction

to fluid power systems design through problem solving in areas of load analysis, circuit control, and component selection.

110-702 Recent Developments in Power Technology (176-502). 2 Cr. Study of recent changes in the field of power technology design to provide the teacher with competencies related to these changes with respect to his needs as a teacher.

110-744 Problems in Industry and Technology — Electronics. 2-6 Cr.

110-798 Problems in Industry and Technology — Power Technology: Automotive, Aviation, Electronics, Fluid Power, Energy, Safety (176-547). 2-6 Cr. Substantive study and activity for specialists in the Energy-Transportation field to include library work, field observation, laboratory work planned by the student and approved and supervised by a faculty consultant in Power Technology. Preparation of a technical report may be repeated for a maximum of six semester credits. Prerequisite: 190-739.

130-527 Topography (148-326). 2 Cr. Calculate and convert previously compiled field work data into usable language for maps, profiles, and land descriptions.

130-531 Machine Design. 2 Cr. An introductory survey of machine design, including: design philosophy and procedure, considerations of material properties, manufacturing processes, stress analysis, and characteristics of major machine elements.

130-532 Mechanical Design (148-301). 4 Cr. A study of the design process. Analysis and design of machine elements including gearing, bearings, shafting, and friction devices.

130-535 Graphic Analysis and Computation (148-475). 2 Cr. The study of fundamental graphical concepts, abstract graphic principles, formulas, and equations, vector geometry, and graphical concepts as they apply to modern engineering technology.

130-557 Color Separation (137-450). 2 Cr. Study of the nature of color and light. Color separation from reflected and transmission copy. Theory of filters, densipometry, and their relation to color separation. Direct and indirect photographic color separation methods.

130-592 Mechanics of Machinery I. 3 Cr. The study of dynamics as applied to machinery including: rectilinear and curvilinear motion; translation and rotation of a rigid body, force-acceleration equation, impulse and momentum; work, power, and energy; balancing and vibration.

130-593 Mechanics of Machinery II. 3 Cr. Graphical and analytical analysis and synthesis of linkages, cams, and gear trains, including displacement, velocity, acceleration, and dynamic forces.

130-615 Industrial Design Workshop (148-463). 2 Cr. Product design from the inception of the idea to marketing the product. Procedure and techniques will be illustrated — some opportunity for laboratory work.

130-629 Architectural Design III (148-451). 3 Cr. Area planning; problems oriented toward design solutions of building complexes: exterior space, land use, and relationships between buildings and supporting facilities. Survey of contemporary regional and city planning and its historical roots.

130-636 Computer Assisted Design Problems (148-476). 2 Cr. An introduction to the relationship of the computer to drafting and plotted design, design automation, introduction to mechanical design problem analysis for computers, mathematical and simulation models for use in the solution of mechanical design problems.

130-637 Product Development (148-434). 2 Cr. Independent research directed to the solution of a student-selected design problem requiring application of the sciences, industrial graphics, identification of manufacturing methods, marketing and cost analysis, and model or prototype construction when appropriate.

130-638 Mechanical Design Problems (148-401). 1-6 Cr. Design of a machine including specifications, scheduling design work, layout, calculations, bill of material and final report.

130-716 Seminar in Industrial Graphics (148-546). 2 Cr. Review of commercial practices in industrial graphics including drafting departments, design, standards, documentation, dimensioning, symbology, equipment, media and automated processes.

130-717 Theoretical Foundations for Technical Drawing (148-501). 3 Cr. A study of various concepts for accurately representing three-dimensional spatial relations on a two-dimensional surface.

130-718 Recent Developments in Industrial Graphics (148-525). 3 Cr. The implementation of teaching currently accepted drafting theories and concepts as practiced by modern industry. New developments in materials and hardware and their utilization within the curriculum.

130-744 Operational Materials for Graphic Arts (137-550). 2 Cr. A penetrating study of operational materials for the major areas of graphic arts with reference to the economics of selection.

130-798 Problems in Industry and Technology (137-541 and 127-543). 2-6 Cr. Substantive study and activity for specialists in the Graphic Arts field to include library work, field observation, laboratory work planned by the student and approved and supervised by a faculty consultant in Graphic Arts. Preparation of a technical report may be repeated for a maximum of six semester credits.

150-440 Plant Layout and Materials Handling (150-310). 3 Cr. Survey and application of the principles and methods used for solving plant layout and material handling problems.

150-500 Engineering Economy (150-424). 3 Cr. Analysis of the source and application of funds, including cost control, valuation, depreciation, replacement theory, and taxation.

150-510 Production Processing (150-428). 3 Cr. Production Processes with special consideration to product design as related to economic production. Emphasis on factors which influence the choice and sequence of process to obtain an end product.

150-513 Introduction to Educational Systems Analysis. 3 Cr.

150-520 Statistical Quality Control (150-442). 3 Cr. Application of statistics and probability theory in quality control. Emphasis on statistical theory underlying Schewart Control Charts, acceptance sampling plans, and introduction to design of experiment and analysis of variances.

150-530 Human Factors Engineering (150-430). 3 Cr. A survey of the areas of man-machine interface. The physiological and psychological abilities and senses of man will be examined, together with technological advances in the interface areas of control, working performance, reliability, comfort, and safety. (The emphasis will be on effective design of man and work environment as a cybernetic system.)

150-600 Industrial Supervision (150-450). 3 Cr. An overview of the supervisor's role in accomplishing organizational objectives through the management of human resources. Concepts of organizational and individual behavior serve as a foundation for the development of such supervisory skills as communication, motivation, initiating change, discipline, delegation, and handling grievances.

150-610 Inventory Management (150-470). 3 Cr. A course covering the principles and techniques of ordering, storing, issuing and control of inventory throughout the manufacturing process. Special attention will be focused on the principles and applications of the Economic Order Quantity, the reorder point, safety stock, material movement, warehousing and distribution of the finished product.

150-650 Introduction to Operations Research (150-445). 3 Cr. Business and industrial application of operations research techniques using linear programming, decision models, and Monte Carlo methods. Problem applications in allocation, sequencing, waiting lines, and competitive strategies.

150-660 Industrial Management (150-460). 2 Cr. Principles and methods of analyzing and solving industrial problems. Application through case studies, management games, and special problems.

150-700 Systems Analysis and Design (150-512). 3 Cr. A survey of design approaches to industrial research. Application of appropriate research tools to analyze and design jobs, organization, operating systems and product/market studies.

150-710 Seminar in Industrial Operation (150-520). 3 Cr. Discussion of current, theory and practice of operation of engineering, marketing, manufacturing, financial administration and industrial relations aspects of industry. These integrated systems will be analyzed based upon the management of objectives concept.

150-713 Introduction to Educational Systems Analysis. 3 Cr. Application of quantitative methodology to the selection of educational problems.

150-720 Foundations in Industrial Operations (150-550). 2 Cr. This course is designed to improve the student's competencies in all aspects of industrial technology. A major professor will be identified who will serve as a tutor in guiding the student's self-development program. There will be a culminating matriculation to candidacy examination to assure minimum proficiency standards.

150-730 Advanced Technical Problems — Industrial Management (150-510). 2-6 Cr. Advanced study in industrial management, management control, product development or process and facility planning. Recent developments, advanced technical work, experimental work, and technical reports. A specific problem area for study in this course must be identified by the student prior to registering for this course. Prerequisites: 421-740, 150-700.

150-740 Introduction to Decision Theory (150-514). 3 Cr. Application of quantitative methodology to the solution of industrial problems.

150-790 Synergistic Experience: Advanced Manufacturing System (150-590). 3 Cr. This course is designed as a capstone experience to integrate and synthesize previous learnings within the context of an industrial environment. The total integrated systems approach will be applied to an industrial project. This may be either research in a simulated multi-factor industrial situation or an internship assignment. Prerequisites: 150-700, 150-710, 150-720, and 150-740.

170-501 Technology — Resources — Environment. 2 Cr. A problem solving course which will show our present and probable future position with respect to known available resources. The relationship between rate of resource use and environmental degradation will be demonstrated, and possible consequences of our present resource consumption patterns will be considered. A pursuit of ecologically sound resource consumption patterns, more appropriate to the presently known available resources, will be conducted.

170-505 Tool and Machine Conditioning (196-464). 2 Cr. Technical information on woodworking equipment, cutting theory, safety, and shop organization. Maintenance of woodworking machines, saw fitting, and general hand tool fitting.

170-507 Maintenance of Metal Working Equipment (157-462). 2 Cr. Repair and preventive maintenance of machine tool equipment. Emphasis on use of universal tool and cutter grinder. Alignment, fitting, and adjustment of precision machine tools, preventative maintenance of welding equipment and sheet metal fabrication tools.

170-510 Industrial Materials (100-520). 4 Cr. A broad technical study of common industrial materials normally dealt with and used for a multitude of industrial and domestic applications. The study of materials will begin with a review of the structure of matter

continuing then to consider the material families for common properties and significantly different characteristics.

170-535 Tool and Die Making (157-461). 2 Cr. Operations and technical information units for selected examples of single station cutting dies; drawing, expanding, non-cutting, assembling, progressive, and finishing dies. Layout, fabrication methods and operations involved are planned by the student.

170-537 Numerical Control in Manufacturing (157-464). 3 Cr. An investigation of numerical control of machine tools, justification of numerical control, types of control units and systems, feedback systems, manuscript writing and manual programming, tape punching and machine set up, fixture design and tool setting. A working knowledge of the basic machining processes is recommended.

170-550 Plastics II (196-440). 2 Cr. Technical information relating to plastic materials and to tooling design for plastics. Product development with emphasis on experimental design in tooling and quality control.

170-570 Building Construction III (196-421). 2 Cr. A study of current trends in the construction industry based on recent research and developments related to construction materials and techniques.

170-637 Numerical Control II, Programming for Continuous Path Controls (157-474). 3 Cr. Application of the computer for generating programs to machine curved, non-symmetrical surfaces. Involves mathematical concepts of N/C. Interpolation of surfaces between points by straight line or logarithmic methods, writing computer programs and proving problems. Field trips to industries using numerical control equipment.

170-713 Wood Properties I: Structure and Characteristics (196-507). 3 Cr. A study of the structure, characteristics and physical properties of wood and wood fiber as industrial materials. Testing of physical properties: static bending, impact, compression, shear, tension and hardness; moisture content, specific gravity; dimensional change and micro-macro photography.

170-715 Plastics Materials and Processes (196-540). 3 Cr. Recent developments in materials, machinery, processing and markets in the plastics industry.

170-798 Problems in Industry and Technology (100-542). 2-6 Cr. Substantive study and activity for specialists in the materials and processes field to include library work, field observation, laboratory work planned by the student and approved and supervised by a faculty consultant. Preparation of a technical report may be repeated for a maximum of six semester credits. Prerequisite: 190-739.

170-946 Advanced Problems, Wood Techniques. 2-4 Cr. In-depth technical study of an identified segment of the substantive field. Includes library work, industrial visitation, laboratory activity and preparation of a technical report of this study. May be repeated for a maximum total of four semester credits.

190-525 Industrial Arts for Elementary Teachers (449-425). 2 Cr. Development, philosophy, objectives, and course organization for industrial arts for the elementary schools. Suitable laboratory work in woods, metals, plastics, and drawing.

190-533 Shop Planning and Equipment Selection (449-433). 2 Cr. Principles of school shop planning including equipment selection and placement, plus selection, care and arrangement of supplies.

190-606 Learning Activities in Industrial and Vocational Education (449-606). 2 Cr. A study and design of learning activities for industrial and vocational education. Learning activities will be developed on selected levels of the cognitive, psychomotor, and effective domains to carry out stated behavioral objectives. An evaluation of the appropriateness of learning activities as presented in contemporary curriculum projects.

190-637 School Shop Organization and Management (449-437). 2 Cr. Experience in administration, project development and teaching problems associated with industrial education.

190-700 Curriculum for American Industry (102-500). 4 Cr. Special topics on current developments in the field. Each seminar devoted to a specific development to be indicated with a sub-title and description.

190-701 Foundations of American Industry (102-501). 4 Cr. A study of the substantive conceptual areas of American Industry: communication, transportation, finance, property, research, procurement, relationships, marketing, management, production, materials, processes, and energy. Prerequisite: 190-700.

190-702 Interrelationships of American Industry Concepts (102-502). 3 Cr. Interrelationships of American Industry Concepts: communication, transportation, finance, property, research, procurement, relationships, marketing, management, production, materials, processes, and energy. Prerequisite: 190-701.

190-704 History of Industrial Education (449-504). 2 Cr. Evolution of modern industrial education through the people, movements, events and institutions that contributed to its formation. Developments and conditions in education and society also considered, plus their relationship to the theory and practices of industrial education throughout the years.

190-708 Issues in Industrial Arts (449-508). 2 Cr. A seminar dealing with selected current issues in industrial arts. Developments of abilities to develop a position and defend it, to be critical without being offensive, and to be professional in an emotional atmosphere.

190-710 Curricular Innovations Affecting Industrial Arts (449-510). 2 Cr. Study of current innovative programs and practices in industrial arts.

190-735 Problems in Industrial Education (449-535). 2 Cr. Identification, selection, and the completion of a problem in industrial education, culminating in a Plan B paper. Prerequisite: 190-740.

190-738 Course Construction in Industrial Education (449-538). 2 Cr. Directed experience in curriculum development and course of study construction for industrial education teachers. Experiences in developing behavioral objectives and in the development of instructional materials which will lead to the realization of these objectives. A vehicle of instruction will be the development of a course of study, instructional package, and/or unit of instruction.

190-739 Introduction to Problems in Industry and Technology (100-540). 1 Cr. Study of selection criteria for advanced technical problems in industry and technology, development of techniques appropriate to attacking these problems, identification of industries and organizations relating to these problems and preparation of a detailed proposal to explore a particular problem. Students should enroll for this during their first graduate enrollment and should plan to take the appropriate Problems in Industry and Technology course during their next enrollment. May not be repeated for credit.

190-740 Synthesis of Problems in Industry and Technology (449-540). 2 Cr. A synthesizing and professionalizing experience with the substance of 100-540 as the base. Preparation and presentation of oral and written reports, evaluation of experiences. Satisfactory completion of the seminar paper for this course may constitute meeting the Plan B requirements for the Master of Science degree with a major in industrial education. Prerequisite: 190-739, 421-740.

190-746 Seminars in Industrial Education No. 8. Improving the Local-School Industrial Education Program (449-546). 2 Cr. Identifying goals and outcomes for the local-school; development of immediate and long-range curriculum plans; cooperating with local school administrative units in planning for improvement; use of the new Wisconsin Curriculum Guide for industrial education; initial preparation of individual courses of study for the local school program using behaviorally stated objectives.

190-770 Thesis — Industrial Education (449-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

HOME ECONOMICS

200-681 Problems in Home Economics (200-481). 2 Cr. This course will deal with special problems in depth as initiated by an instructor or according to student needs and interests. This course should serve as a culminating educative experience for students in the various areas of home economics.

200-698 National Study Tour in Home Economics (200-498). 1-3 Cr. Group membership limited to 20 and majors of the particular area to be studied have priority. Study visit to a major United States city relating student's learning in his major area to business and industry.

200-730 Seminars in Home Economics.

200-764 Current Problems in Home Economics (200-564). 2 Cr. This course will be designed to meet student needs and interests concerning the relevant problems in home economics.

212-535 Seminar on Self-Growth (212-435). 2 Cr. A seminar based on a study of theories of the self. Exploration of selected aspects of self-development and actualization.

212-541 Home Intervention Programs in Early Childhood Programs. 1 Cr. Planning, supervissing, and implementing a home intervention program for young children and their families.

212-545 Preschool Programming for the Mentally Handicapped. 2 Cr. Program development and implementation for preschool mentally handicapped children.

212-580 Future of the Family. 1 Cr. Evaluation of experimental and utopian forms of the family and study of the future of the family.

212-581 Dynamics of Marital Interaction (212-481). 2 Cr. Patterns of husband-wife power distribution, task differentiation, decision making, communication, role adaptation, and marital satisfaction over the family life cycle. A theoretical analysis of marital behavior within the family as a social system.

212-598 American Study Tour in Child Development (212-498). 2 Cr. Study tour of child development centers. Discussions and lectures by leaders in the field of child development.

212-607 Parent Counseling (212-407). 2 Cr. Various approaches and techniques of working with parents. Observation and experience with problems parents face in child-rearing.

212-624 Advanced Child Study (212-424). 3 Cr. A study of principles and review of literature pertaining to children.

212-626 Special Topics in the Study of Family Life (212-426). 3 Cr. A review of programs and literature related to family life with opportunity for individual study of problems of personal or professional interest.

212-637 Seminar in Child Development (212-437). 2 Cr. Exploration in depth of special problems and aspects in child development field with preference given to student's interests.

212-664 Problems in Early Childhood Curriculum (477-564). 3 Cr. Philosophy and methodology of early childhood education with emphasis on problems confronting teachers in this area. (This course was originally entitled, Problems in Preschool Education).

212-665 Administration of Early Childhood Education Programs (447-465). 2 Cr. A study of program organization, program design, staffing, licensing, certification, equipment and facilities for operating early childhood education programs. Field trips required.

212-685 Seminar on the Culturally Disadvantaged Child and Family (212-485). 3 Cr. Study of problem, needs, related research and current trends to assist the disadvantaged child and family toward fuller actualization of potentialities for self and society.

212-703 Seminar in Child Development (212-503). 2 Cr. Advanced seminar in study of all aspects of child development.

212-707 Issues and Problems in Parent Education (212-507). 2 Cr. A study of the issues and problems of parent groups and the training of parent-group leaders.

212-728 Family Life Issues (212-528). 2 Cr. A study of current issues and problems in marriage and the family. An investigation of research, literature and consideration of theoretical interpretations in today's world. An exploration of how familial experiences affect behavioral patterns and attitudes of children, adults and self.

212-740 Special Problems in Family Life Education (212-540). 2 Cr. Planning and implementation of community programs in family life education.

212-742 Human Development (212-542). 2 Cr. Human development theory, research, changing trends, problems and interpretations will be explored. Emphasis on application of scientific knowledge to practical relationships with children in the family, school, and community and implications of child development concepts towards understanding of self and others.

212-766 Problems in Early Childhood Education (477-566). 3 Cr. Overview of issues in early childhood education with emphasis on problems confronting teachers in establishing early childhood programs in communities and schools.

214-545 Textiles for Institutions 2 Cr. Raw materials, fabric structures, specifications and legislation related to quality, performance and maintenance of textiles for institutional uses.

214-580 Flat Pattern (214-313). 3 Cr. A study and application of the techniques of pattern designing through drafting methods. An original garment is designed and constructed.

214-590 Practicum in Textile Design (214-331). 3 Cr. An exploratory course devoted to the use of the following textile design techniques as a means of artistic expression: stitchery, weaving, knotting, applique and hooking. Emphasis will be placed on good design and creativity.

214-592 Practicum in Textile Printing (214-337). 2 Cr. Exploring use of textile design techniques, primarily silk screen, tye dye, printing, and batik. Emphasis will be placed on good design and creativity.

214-602 Problems in Home Economics (214-481). 2 Cr. This is a special course usually taught by a visiting instructor.

214-605 European Study Tour (214-465). 3-6 Cr. Tour of European centers of art, clothing, and textiles. Study of the cultural patterns. Six week program includes lectures by consultants and seminars on the various phases of the fashion and fabric industries.

214-610 History of Costume: Ancient to European 1900 (214-471). 3 Cr. Development of costume throughout the ages. Fashion as it reflects the cultures of the past and influences present-day costume.

214-611 History of American Costume (214-475). 2 Cr. American costume as it evolved from colonial to contemporary times with emphasis on costume characteristics and social, political, religious and cultural influences.

214-617 Social-Psychological Aspects of Clothing (214-480). 3 Cr. The social significance of clothing to an individual and the influence it has upon his behavior.

214-639 National Study Tour to Fashion Industry (214-498). 1 Cr. Five day visit in New York City (or alternate city). Program will involve study hours, discussions, and lecture by leading people in American fashion market.

214-640 Textiles II (214-407). 2 Cr. Problems involving fiber identification, fabric, performance, and fabric care. Chemical and microscopic testing procedures. Investigation methods for gathering and interpreting data. Individual problems.

214-655 Recent Developments in Clothing and Textiles (214-479). 2 Cr. Various areas of apparel and textiles are explored in light of new developments in these and related fields.

214-666 Tailoring (214-450). 3 Cr. Application of tailoring techniques in making suits and coats.

214-680 Draping (214-412). 3 Cr. Application of draping principles in the designing and construction of garments. Emphasis on creativity.

214-685 Apparel Design (214-439). 2-4 Cr. Development of designs and construction of apparel using advanced techniques.

214-690 Advanced Textile Design. 1 Cr. Exploration in depth of the creative potentials of specific areas in textile design — stitchery-applique'.

214-691 Advanced Textile Design. 1 Cr. Exploration in depth of the creative potentials of specific areas in textile design — non-loom interlacing thread techniques (spring macrame, netting, knitting, crocheting).

214-692 Advanced Textile Design. 1 Cr. Exploration in depth of the creative potentials of specific areas in textile design.

214-693 Structural Design and Weaving (214-431). 2 Cr. A studio course involving experiences in weaving and other structural techniques.

214-695 Decorative Fabrics (214-411). 2 Cr. Study of historic and contemporary fabrics with analysis of designs and techniques of decorating fabrics. The contribution of decorative fabrics to the enrichment of human experience.

214-718 Clothing Today's Family (214-505). 2 Cr. Clothing needs as affected by various psychological, sociological, and economic influences. Selection, purchase, care, and budgeting of clothing for family members.

214-740 Advanced Textiles (214-572). 2 Cr. Investigations and new developments in the textile field. Opportunity for individual problems.

214-760 Seminar in Clothing and Textiles (214-514). 2 Cr. Discussion and interpretation of recent developments in clothing and textiles. Individual reports.

214-765 Workshop in Clothing and Textiles (214-544). 2 Cr. Opportunity for cooperative work in some aspect of clothing study.

214-780 Advanced Apparel Design (214-517). 3 Cr. Advanced study of creative apparel design and development of designs through draping or flat pattern methods.

214-798 Problems in Clothing and Textiles and Designs (214-551). 2 Cr. Identification, selection and completion of a problem in clothing and textiles culminating in a Plan B paper. Prerequisite: 421-740.

214-799 Thesis — Clothing and Textiles (214-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Prerequisite: 421-740.

229-583 Seminar in Food Service Administration. 2 Cr.

229-608 Advanced Meal Management Practicum (229-408). 2 Cr. Individualized problem-solving of critical incidences in meal management: variations of meal service for entertaining, meals at different economic levels, use of specialized equipment in meal preparation and service, and other interrelated problems.

229-618 Diet Therapy (229-418). 3 Cr. Principles and methods for the use of diet as a therapeutic measure in certain pathological conditions.

229-620 Food Styling and Creative Cookery. 2 Cr. Food as media for artistic expression. Effective use of color, form and texture in food styling.

229-631 Readings in Food Science and Nutrition (229-431). 2 Cr. Critical reading, evaluating, and reporting from pertinent current journals and other publications.

229-633 Maternal and Child Nutrition (299-433). 3 Cr. Application of basic knowledge to maternal, infant, child, and adolescent nutrition.

229-638 Experimental Foods (229-438). 3 Cr. Experimentation with selected food materials, techniques, and equipment. Opportunity for directed study in an individually chosen area.

229-642 Advanced Foods (229-442). 2 Cr. Comparative studies of food selection and preparation; appraisal of foods.

229-646 Food Preservation (229-446). 1 Cr. Principles and practical application of methods of food preservation and storage.

229-661 Social and Cultural Aspects of Food (229-461). 2 Cr. Social, economic, and cultural influence on man's food patterns.

229-665 European Foods Study Tour (229-465). 3-6 Cr. Tour to study cultures, food patterns, and different phases of food industries in Europe.

229-701 Trends in Nutrition (229-501). 2 Cr. Practical application of recent developments in the field of nutrition.

229-702 Minerals and Vitamins (229-502). 3 Cr. Absorption and intermediary metabolism of minerals and vitamins.

229-708 Food Seminar (229-508). 2 Cr. Discussion and interpretation of recent developments in food preparation, food processing and food products. Choice of problems based on the needs and interests of the students.

229-711 Nutrition Seminar. 2 Cr. Discussion and interpretation of recent developments in fundamental and applied nutrition. Choice of problems based on needs and interests of students.

229-729 Proteins (229-529). 3 Cr. Digestion, absorption, and intermediary metabolism of protein.

229-730 Recent Developments in Food Science (229-530). 2 Cr. Consideration of current research

which gives perspective in food science. Prerequisites: 421-761 or 421-740.

229-736 Carbohydrates and Lipids (229-536). 3 Cr. Digestion, absorption, and intermediary metabolism of carbohydrates and lipids.

229-746 Modern Methods in Food Preparation (229-546). 2-3 Cr. Individual development of subject matter, evaluation instruments, instructional materials and demonstration techniques.

229-747 Problems in Food Science and Nutrition (229-547). 2 Cr. Identification, selection and completion of a problem in food science and nutrition, culminating in a Plan B paper. Prerequisites: 421-740.

229-756 Advanced Experimental Food (229-556). 3-4 Cr. Principles of research methods applied to directed investigations in food preparation.

229-770 Thesis — Food Science and Nutrition (229-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

242-503 Programs in Home Economics for the Middle School (242-303). 2 Cr. Development of techniques, materials, and curriculum concepts in home economics with the application of principles of human growth and development for teaching in the middle school.

242-620 Vocational Programs in Home Economics (242-420). 2 Cr. Techniques, materials and curriculum for wage earning programs in home economics in the secondary and post-secondary school. Preliminary procedures for program development included.

242-623 Education for Consumer Homemaking (242-423). 1 Cr. Development of curriculum including evaluation of methods and materials for teaching consumer education at secondary level.

242-625 Occupational Education in Clothing Services (442-420). 2 Cr. Development of the concept of occupational education in secondary, post-secondary and adult programs in home economics; specifically related to a cluster of courses in clothing services.

242-630 Concepts of Extension Education (442-430). 3 Cr. Study of the concepts and processes involved in conducting educational programs for adult and youth; includes philosophy, objectives and organization of extension education, leadership, development, program development, teaching methods and evaluation.

242-640 Health Programs in Home Economics. 2 Cr. Curriculum and methodology for health programs in home economics including occupational programs.

242-651 Family Life Education Programs (242-451). 2 Cr. Development of family life education programs including methods, materials and techniques for teaching family relationships and child development at the secondary level.

242-708 Curriculum Studies in Home Economics (442-508). 2 Cr. Principles of curriculum construction. Review of recent literature on curriculum development. Evaluation of curriculum practice and techniques.

242-710 Applied Evaluation in Home Economics. 2 Cr. Theory and application of principles in planning evaluation techniques in home economics to assess behavioral changes in the cognitive, affective, and psychomotor domains.

242-712 Home Economics for the Junior High School (442-512). 3 Cr. Principles of curriculum development for the home economics program in the junior high school. Emphasis on recent research, philosophy, and emerging practices in program patterns.

242-720 Current Problems in Home Economics Education (442-520). 2 Cr. Consideration of problems in contemporary living that are affecting home economics education and their influence on the teaching of homemaking.

242-721 Home Economics Occupation Oriented Institute (442-521). 4 Cr. Development of an understanding of the learner and his environment. Preparation of outlines and materials for secondary level home economics occupation-oriented courses to meet the needs of these learners.

242-728 Organization and Administration of Home Economics (200-528). 2-3 Cr. Opportunity for advanced students to work on solution of actual field problems dealing with organization and administration of home economics in various types of schools.

242-744 Seminar in Home Economics Education (442-544). 2 Cr. Readings, discussions, and reports of recent literature in education with implications for teaching home economics. Paper on individual problem.

242-744 Seminar No. 1 — New Developments in Curriculum Construction (442-544). 2 Cr. A study of new developments which relate home economics and education as they concern curriculum construction.

242-744 Seminar No. 2 — New Developments in Methods and Materials (442-544). 2 Cr. A study of new developments of methods and materials appropriate for home economics education.

242-744 Seminar No. 3 — New Developments in Departmental Planning (442-544). 2 Cr. A study of the concepts of space and equipment and development of principles and guidelines of home economics departmental planning.

242-744 Seminar No. 4 — College Teaching in Home Economics (442-544). 2 Cr. Educational techniques, methods and materials especially applicable to college teaching in home economics.

242-744 Seminar No. 5 — Individualized Instruction (442-544). 2 Cr. Study of the multi-role of the

home economics teacher in the guidance of the home economics students in the classroom.

242-744 Seminar No. 6 — Contemporary Issues in Home Economics Education (442-544). 2 Cr. Contemporary issues in home economics education.

242-744 Seminar No. 7 — Auxiliary Workers in Home Economics (442-544). 2 Cr. A national trend toward employment of para-professionals or auxiliary workers is observed in many areas of labor. An exploration of these possibilities in home economics and plans for their education will be foci of this course.

242-770 Thesis — Home Economics Education (442-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

242-775 Problems in Home Economics Education (442-575). 2 Cr. Identification, selection, and completion of a problem in home economics education, culminating in a Plan B paper. Prerequisite: 421-740.

245-501 Food Service Administration (245-328). 3 Cr. Organization and administration of food service systems, personnel selection and training, cost control, and problems of management.

245-503 Advanced Food Production Management (245-475). 3 Cr. Advanced food production planning and controls with management experience in campus food services.

245-513 Quantity Food Production and Service (245-452). 3 Cr. Application of the principles of food preparation to large quantity production, menu and formula standardization; food production costs; and menu planning for institutions.

245-521 Food Service Equipment (245-318). 2 Cr. A comprehensive study of the factors affecting design, selection, layout, and uses of food service equipment and facilities. A quantitative approach in optimum utilization of physical and human resources. Students plan actual layouts of different types of food facilities.

245-531 Ecology of Habitat. 2 Cr. A broad philosophical as well as physical perspective of human housing and which includes international aspects. A deep insight into family housing needs and the achievement of learning regarding these needs through laboratory experience. Value is placed upon the role of the home economist in the solution of world housing problems. Prerequisite: six cr. of housing, equipment, or equivalent.

245-583 Food Service Seminar. 2 Cr. Discussion and interpretation of recent developments in institution management. Choice of problems based on needs and interests of students.

245-650 Family Housing (244-444). 3 Cr. Appreciation and understanding of differences in socio-economic factors of the environment which influence effective utilization of family housing resources. Emphasis will be on adjustment and flexibility of safety, comfort, convenience, physical and financial maintenance based on the family cycle. Field trips and individual projects.

245-651 House Evaluation Seminar (244-445). 2 Cr. Appreciation and understanding of the socio-economic factors and environmental conditions which influence effective utilization of family resources. Emphasis will be on costs, adaptability, safety, comfort, convenience, and maintenance based on family needs. Projects will be chosen and studies by the individual or group.

245-655 Major Kitchen Appliances. 3 Cr. The detailed structure and performance analysis of ranges, refrigerators, freezers, disposers, dishwashers, microwave ovens, and selected kitchen appliances.

245-658 Experimental Laundry Procedures (244-440). 2 Cr. To apply current knowledge necessary for effective laundering of household fabrics. Special emphasis on use of equipment in the laundry process, laundry aids, and water composition. Experimental laboratory experience.

245-661 Consumer Problems (244-417). 3 Cr. Factors influencing consumer choices; evaluation of various consumer aids. Consideration of consumer responsibilities to meet current needs. Activities of consumer groups.

245-676 Family Finance (244-428). 2 Cr. A study of the financial decisions and judgements which the average individual and family must make during a lifetime. Emphasis is on income and occupation, family expenditures, credit, savings, taxes, and estate plans.

245-681 Special Problems in Habitational Resources (244-481). 2 Cr. Special seminars on current problems that exist in the area of Habitational Resources. Topics of the seminar can be chosen by the instructor, individual or the group.

245-686 Home Management Seminar (244-408). 1 Cr. To prepare students for management in selected areas of consumer science, family economics, family finance, home management, household equipment, and housing. Opportunity to combine study of special topics and laboratory experiences in home management of family resources in seminars. This course may be repeated for credit.

245-706 Trends in Home Management (244-506). 3 Cr. Philosophically oriented, problem-solving method will provide student with management concepts supplemented by experience with projects in student's individual settings.

245-765 Family Consumer Trends (244-517). 3 Cr. Consideration of contemporary consumer prob-

lems, practices and aids toward selection of qualities needed in certain common household commodities, types of protection including legislation, agencies, affecting consumer well-being and evaluation of consumer information. Field trip. Individual project.

245-777 Contemporary Issues in Family Finance (244-528). 3 Cr. Seminar on selected topics and current issues in finance related to concerns of individuals, families, and financial organizations in the community.

LIBERAL STUDIES

304-500 Drawing (304-401). 1-3 Cr. Continuation of 304-100 with emphasis placed on the exploitation of media for creative and expressive ends. May be repeated.

304-501 Life Drawing (304-420). 3 Cr. The human figure in action and at rest. Problems in figure composition.

304-502 Life Drawing (304-421). 1-3 Cr. Advanced problems in figure composition and in graphic interpretation of the figure. May be repeated.

304-503 Design (304-332). 3 Cr. Development of ideas presented in 304-101 in depth and complexity. May be repeated.

304-504 Interior Design (304-334). 3 Cr. Problems involving the design, selection, and arrangement of furnishings for living and working quarters.

304-505 Problems in Interior Design (304-423). 2 Cr. Advanced work in the design, selection and arrangement of furnishings for living and working quarters. May be repeated.

304-506 Costume Design (304-436). 2 Cr. Development of original designs for clothing. May be repeated.

304-507 Crafts (304-400). 3 Cr. Emphasis on original designs in metal, leather, enamel, and weaving.

304-508 Advanced Crafts (304-404). 3 Cr. This will be planned to suit the needs of the individuals in the group and may include work in one or more of the following crafts: pottery, weaving and silk screen stencil.

304-509 Painting (304-300). 3 Cr. Introduction to the character and use of various painting media. Work from still life and life with reference to problems of two dimensional color composition.

304-510 Painting (304-402). 1-3 Cr. Advanced work in oil painting, with reference to the exploitation on the medium for creative and expressive ends. May be repeated.

304-511 Sculpture (304-320). 3 Cr. Introduction to sculptural concepts.

304-512 Sculpture (304-403). 1-3 Cr. Advanced problems in sculpture with reference to the exploitation of media for creative and expressive ends. May be repeated.

304-513 Ceramics (304-410). 3 Cr. Basic design and techniques of ceramic production for the artist-potter; forming, firing, and decorating.

304-514 Ceramics (304-411). 1-3 Cr. Techniques in the use of clay, glazes, and kiln for the design and production of high fired ceramics. May be repeated.

304-515 Art Metal (304-440). 3 Cr. The design and construction of objects in precious metals.

304-516 Art Metal (304-441). 1-3 Cr. Advanced problems in the design and construction of objects in precious metals. May be repeated.

304-517 Printmaking (304-451). 3 Cr. The techniques of relief and lithographic printmaking.

304-518 Printmaking (304-452). 1-3 Cr. The techniques of intaglio and serigraphic printmaking.

304-519 Weaving (304-424). 2 Cr. Warping a loom; elementary and complex weaving.

304-520 Weaving (304-425). 2 Cr. Advanced problems in weaving. May be repeated.

304-521 Housing (304-448). 3 Cr. Problems in dwelling construction with consideration given to location of the lot, family activities, materials, and cost.

304-522 Modern Art (304-390). 3 Cr. The main currents and developments in art from Monet and Cezzane to 1950.

304-523 Survey of Art: Ancient Through Medieval (304-430). 3 Cr. The painting, sculpture, architecture and minor arts in the ancient western world.

304-524 Survey of Art: The Renaissance Through to the 20th Century (304-431). 3 Cr. Sculpture, painting, architecture and minor arts of the western world from 14th Century to present.

304-525 Egyptian and Mesopotamian Art (304-480). 3 Cr. The evolution of the arts of ancient Egypt and the Near East.

304-526 Greek and Roman Art (304-481). 3 Cr. The arts of ancient Greece and Rome.

304-527 Medieval Art (304-482). 3 Cr. The arts of Europe and Byzantium from the later Roman Empire to the end of the Middle Ages.

304-528 Italian Renaissance Art (304-483). 3 Cr. The problems and the evolution of Italian Renaissance sculpture and painting from the 14th to the 18th Century.

304-529 Northern Renaissance Art (304-484). 3 Cr. The evolution of Renaissance art in northern Europe from the 15th to the 18th Century.

304-530 Northern Baroque Art (304-485). 3 Cr. Architecture, painting, sculpture and other art forms of 17th Century northern Europe.

304-531 Southern Baroque Art (304-486). 3 Cr. The development of art in northern Europe from the Italian Renaissance to the 18th Century.

304-532 Economics of House Furnishing (304-432). 3 Cr. Study of consumer house furnishing problems based on utilitarian, economic, aesthetic and social values of household commodities. Quantity and quality budgets at different price levels. Visits to house furnishing markets.

304-533 Period Furnishings (304-434). 3 Cr. A survey of furniture and furnishings in the Western World.

304-600 Eighteenth Century European Art (304-487). 3 Cr. The evolution of European art forms during the 18th Century.

304-601 Pre-Columbian Art (304-488). 3 Cr. The arts of the Americas, including Incan, Mayan, and Aztec from 1200 B.C. to 1550 A.D.

304-602 American Art (304-489). 3 Cr. The development of the visual arts in the United States from the Colonial period to 1950.

304-603 Nineteenth Century Art in Europe (304-490). 3 Cr. History of European art from 1800 to 1900.

304-604 Art Since 1950 (304-491). 3 Cr. Developments in painting and sculpture in Europe and America since 1950.

304-605 Oriental Art (304-492). 3 Cr. Art from prehistoric times to the 19th Century in India and the Asian sub-continent.

304-606 Oriental Art (304-493). 3 Cr. Art from prehistoric times to the 19th Century in China, Japan and their spheres of influence.

304-607 Esthetics (304-498). 3 Cr. A seminar based on a study of statements by philosophers on art.

304-700 Drawing (304-501). 3 Cr. Concentration on the development of visual sensitivity through drawing with various media.

304-701 Drawing Seminar (304-558). 3 Cr. The problems considered in the studies in the seminars will be individualized in terms of each student's responsibilities. Consideration will be given in all to the integration of problem solutions in the total program of industrial education and in the total program of education.

304-702 Advanced Experiments in Drawing (304-559). 3 Cr.

304-703 Painting (304-502). 3 Cr. Introduction to the character and use of various painting media. Work from still life and life with reference to problems of two dimensional color composition.

304-704 Sculpture (304-503). 3 Cr. Continuation of investigation of sculptural media for creative and expressive ends. May be repeated.

304-705 Ceramics (304-511). 3 Cr. Basic design and techniques of ceramic production for the artist-potter; forming, firing, and decorating.

304-706 Art Metal (304-541). 3 Cr. The design and construction of objects in precious metals.

304-707 Printmaking (304-551). 3 Cr. Continuation of investigation of traditional, contemporary and experimental printmaking techniques and media for creative and expressive ends. May be repeated.

304-708 Modern Art (304-590). 3 Cr. Main currents of modern painting, sculpture, and architecture. Manet, Monet, Cezanne, Matisse, Picasso, Rodin, Brancusi, Mies Vander Rohe, Le Corbuiser, et al and their contributions to the development of 20th Century art.

304-709 Seminar in Related Art (304-526). 2 Cr. Flexible course in which the interests and needs of students are given important consideration. Fundamental material in the integration of art with home economics subject matter. Prerequisite: 304-704.

304-710 Seminar in Art (304-556). 2 Cr. The subject matter of the course is governed by the interest and needs of the students enrolled.

308-506 Food Microbiology (308-406). 3 Cr. Fundamental methods of food preservation, their effectiveness, and the related spoilage of food products by microorganisms. Quality control techniques employed in determining the presence of specific groups of economically important microorganisms.

308-520 Compartive Ethology I. 2 Cr. A comparative study of biological basis of human behavior. Primary emphasis to be given to the applicability of the development of animal behavior patterns to human beings. The phylogenetic adaptations of human behavior are to be examined to consider their theoretical importance for the study of the behavioral sciences.

308-550 Seminar in Advanced Comparative Etiology I. 2 Cr. An extension of 308-520. An exploration of phylogenetic adaptations of human behavior, utilizing the comparative model developed in 308-520. Emphasis on the detailed study of sensory, central and motor behavior of animals as they relate to human behavior.

309-601 Regulation of Industry (309-450). 3 Cr. Economic concentration lessening competition or creating a (monopoly) and maintaining competition; changing relationships between government and industry, emphasizing regulatory legislation, administrative agencies, national policies, and social control.

309-679 Marketing Research (309-479). 3 Cr. Experimental and survey techniques used to secure information necessary for successful marketing such as who buys what, when, where, how and why. Primary and secondary sources of information examined. Data collection, compilation, and analysis

methods reviewed plus effective communication of conclusions and recommendations to management.

309-690 Administrative and Business Policies (309-490). 3 Cr. Integrates the student's previous studies in business, and further develops his ability to deal more effectively with business problems by learning and applying the scientific approach to decision making. Includes business cases on policy formulation and administration, involving the functions of manufacturing, marketing, finance, accounting, personnel, and public relations.

311-501 Physical Chemistry Lecture (311-417). 3 Cr. Fundamental physical chemistry; the behavior of gases, the liquid state, the properties of solutions, the principles of thermodynamics, thermochemistry. 311-503 is normally taken concurrently.

311-503 Physical Chemistry Laboratory (311-428). 1 Cr. Laboratory which may accompany physical chemistry, normally taken concurrently. Experimental techniques and apparatus. Treatment of experimental data.

311-511 Biochemistry. 3 Cr. Fundamental chemistry and metabolism of carbohydrates, lipids and proteins. Second and third order structure of proteins. Chemistry of nucleic acids. Nature and dynamics of enzymes and enzyme action. Biological oxidations. Laboratory work involving polarimetry, colorimetry, chromatography and quantitative analytical procedures such as the Kjeldahl determination of protein nitrogen.

311-515 Food Chemistry (311-411). 3 Cr. Organic biochemistry of foods with emphasis on the enzymatic and non-enzymatic changes associated with food preparation and storage, such as the Maillard-Browning reaction, denaturation of protein, changes in color, flavor, odor, texture and nutritive value. Techniques for the isolation and identification of the biochemical constituents of foods.

311-521 Textile Chemistry (311-418). 3 Cr. Chemical and physical properties of monomers and high polymers of the following natural and synthetic fibers: cotton, cellulose derivatives, silk, wool, linen, nylon, polyesters, acrylic, olefins and polyurethanes. Laboratory analysis of textile fibers and textile fiber mixtures and dyestuffs; physical properties of textiles, synthesis of textile polymers, crease resistance. Textile finishing.

311-525 Chemistry of Polymers (311-421). 3 Cr. An elementary study of the chemical and physical nature of polymers and of the methods of preparation and the uses of the principal types of polymeric substances.

311-531 Quantitative Analysis (311-438). 3 Cr. Introduction to the principles of quantitative chemical analysis and training in precision laboratory techniques.

311-535 Instrumental Methods of Analysis (311-450). 3 Cr. Application of instrumental methods to chemical analysis, including electrochemical methods, ultraviolet, visible, and infrared spectrophotometry, radiochemical methods, and applications of common instrumental methods. Techniques for obtaining reliable results by instrumental means.

311-541 Chemistry of Materials (311-445). 3 Cr. The practical applications of the principles and facts of chemistry to technological problems. Topics include: the structure and properties of common materials; fuels — solid, liquid, gaseous, fossil, nuclear — and air pollution; water — domestic, industrial, sewage — and water pollution; electrical properties — cells, batteries, fuel cells, electrolysis — and corrosion of metals; protective coatings — paints, varnishes, enamels, lacquers, plating, anodizing, cladding, etc.

311-551 Chemistry of Industry I (311-555). 4 Cr. A study of the chemistry of the materials used in industry and of industrial production processes.

311-552 Chemistry of Industry II (311-556). 3 Cr. A study of the chemistry of the materials used in industry and of industrial production processes, including instrumentation and testing procedures, research techniques, scientific information and communication and industrial health and safety.

311-561 Industrial Organic Chemistry (311-565). 3 Cr. An introduction to the common industrial organic chemical processes used for the preparation of raw materials and their processing into usable forms suitable for product manufacturing.

320-550 Managerial Economics (320-450). 3 Cr. Decision-making in the firm; demand and cost analysis; competitive and non-competitive price systems, marketing problems, capital budgeting, and criteria for investment decisions.

320-610 Contemporary American Economic Problems (320-510). 3 Cr. Survey of domestic economic problems at advanced level with special emphasis on applications and effects on industry.

320-615 Contemporary International Economic Problems (320-515). 3 Cr. Survey of international economic problems at advanced level with special emphasis on application and effects on domestic industry.

320-720 Labor and Industrial Relations (320-520). 2 Cr. Human relations in industry from the viewpoint of labor, management, and the government.

320-770 Economics in Education (320-570). 4 Cr. Educational economics at the micro level including economists' viewpoint on education, education and national economic growth and growth and development, measures of educational benefits and costs, labor market structure and demand for human skills, availability and allocation of economic resources for education, educational planning at state and national level.

326-515 Technical Writing for Home Economics (326-415). 3 Cr. An overview of specialized writing done by home economists in business. Experience in preparing reports, letters, and other appropriate materials.

326-516 Technical Writing for Industry (326-416). 3 Cr. A survey of the type of writing current in industry. Writing of business reports and other materials.

326-518 Mass Communication in American Society (326-318). 3 Cr. History, social implications, and future of the mass media of communications.

326-541 Psycholinguistics. 3 Cr. A study of linguistics behavior and the psychological processes responsible for it.

326-546 Research Reporting (326-446). 2 Cr. Effective organization and presentation of individual research.

338-520 Economic History of the United States (338-401). 3 Cr. Economic evolution of the United States since colonial times. Development of economic problems and the foundations of modern industry.

338-522 Afro-American History (338-435). 3 Cr. A social, cultural, and political history of the Afro-American in the New World, with the main emphasis upon the United States.

338-540 History of Modern Russia (338-418). 3 Cr. Survey of significant developments in Russia since 1815.

354-741 Computer Programming Techniques (354-541). 2 Cr. Introduction to computer systems and their utilization. Emphasis on translating language with application to individual research projects, statistical or developmental. Not open to students who have completed 354-141.

365-501 Philosophy and Science (365-401). 3 Cr. An analysis of selected problems involved in the assumptions, concepts and methods of the physical sciences and technology and a consideration of the impact of science and technology on other areas of life.

365-550 Philosophical Ethics (365-420). 3 Cr. A problem-oriented study of the area of philosophy which concerns moral decision, this course will involve an enquiry into the various philosophical views on the general norm of morality as well as an investigation into the dynamics of ethical decision in particular areas of life.

372-527 Physics — Electronics (372-327). 3 Cr. Theory and application of semi-conductors, vacuum and gas tubes. Basic principles of electronic circuits.

372-529 Physics — Modern Physics (372-329). 3 Cr. Elements of atomic and nuclear physics and the industrial application of atomic energy.

372-531 Physics — Mechanics I (372-331). 3 Cr. Essential elements of statics including simple force system, theory and application of non-concurrent forces, couples, friction, non-coplanar forces, trusses, and other structures.

372-533 Physics — Mechanics II (372-333). 3 Cr. Essential elements of dynamics including rectilinear, angular, and harmonic motions; forces producing motion, work, energy, acceleration, impulse and momentum.

372-535 Physics — Optics (372-435). 3 Cr. Geometrical and physical optics. Optical instruments, spectrum analysis, diffraction, interference, polarization and lasers.

372-537 Electricity and Magnetism (372-437). 3 Cr. The properties of electric and magnetic fields in free space and in material media.

372-641 Fluid Mechanics (372-441). 3 Cr. The basic properties of fluids in motion are developed for both compressible and incompressible fluids. The equations of fluid flow are developed and solved for both rotational and irrotational flows.

372-705 Classical Physics in Industry (372-505). 3 Cr. Selected topics in classical physics are studied. Emphasis is placed on topics that have important industrial applications.

372-706 Modern Physics in Industry (372-506). 3 Cr. Selected topics in modern physics are studied. Emphasis is placed on topics that have important industrial applications.

375-550 Politics and Technology (375-455). 3 Cr. A contemporary and future look at technological innovations will show an increased relationship between the political institutions of a country and the promotion, regulation, and impact of industry and technology. This relationship will be explored in the United States as well as other selected countries.

387-515 Problems of American Society (387-411). 3 Cr. Sociological perspective on selected social problems.

387-525 Sociology of Leisure (387-425). 3 Cr. An institutional approach to the effects of leisure on social structure; the values reflected in leisure; problems attending the increase in leisure resources.

387-530 Sociology of the Community (387-430). 3 Cr. Structure of the community, chiefly in the United States. Variability and current trends; research techniques; community development.

387-540 Sociology of Work (387-440). 3 Cr. Human behavior in various types of employment and occupations; trends in the occupational structure of the United States.

387-560 Sociology of Juvenile Delinquency. 3 Cr. Definitions and trends of deviant behavior among youth; research findings; efforts toward prevention, control, and treatment.

387-575 Sociology of Minority Groups (387-475). 3 Cr. Social-psychological aspects of the interaction between majority and minority groups; trends of minorities in the United States.

387-590 Sociological Theory (387-490). 3 Cr. Contributions of major social theorists; chief components of contemporary general sociological theory.

387-710 Sociological Foundations for Guidance (387-510). 3 Cr. A sociological perspective will be briefly introduced (or reintroduced), applied to an examination of certain problems of modern society relevant to the practice of the guidance counselor, and finally, directed to an analysis of the social role of the guidance counselor.

391-508 Speech Skills for Business and Industry (391-405). 2 Cr. Teaching in technical speaking; projects emphasizing the application of speech skills and activities in business and industry.

391-512 Speech Skills for Educators (391-406). 2 Cr. Application of leadership techniques and speech skills in classroom and educational activities.

391-554 Television Programming and Performance (391-470). 3 Cr. Planning, writing, and performing in instructional, public service, special feature, or dramatic television programs. Programs will be produced in cooperation with students in 107-493.

EDUCATION

407-535 Film: History and Appreciation (407-435). 3 Cr. Traces the evolution of the motion picture film as a medium of mass communication and aesthetic expression; contributions of noted film producers are identified.

407-560 Audio-Visual Communication (407-460). 2 Cr. Methods of selecting and using audio-visual materials effectively in teaching. Experience in operating equipment, basic techniques of media preparation, practice in planning and presenting a lesson.

407-561 Preparation of Audio-Visual Materials (407-461). 2 Cr. The planning and production of opaque materials, charts, graphs, posters, transparencies, bulletin boards, displays, models, mock-ups, specimens, script writing, chalkboard aids, and recording techniques.

407-593 Television Production Techniques. (407-493). 3 Cr. Production of television programs in cooperation with students in 391-554. Each student will gain experience as director, technical director, cameraman, floor manager, audio controlman, telecine operator, and lighting director. Includes related technical information.

407-636 Fundamentals of Motion Picture Production (407-436). 3 Cr. Fundamentals of super 8mm and 16mm, film production. Production planning, cost estimating, visual continuity, shooting, animation, editing, sound recording, titling, laboratory services, and other technical problems of production. Individual and group projects.

407-694 Instructional Communications Systems (407-494). 2 Cr.

Application of electronic communications systems used to solve educational problems. Audio systems including microphones, tape decks, and duplicators, paging systems, language labs and intercommunication equipment; multimedia systems including information retrieval, multiple response, and simulators.

407-722 Problems in Audio-Visual Communications (407-522). 2 Cr. Identification, selection, and completion of a problem in audio-visual communications, culminating in a Plan B paper. Prerequisite: 421-740.

407-730 Media Retrieval Systems (407-530). 2 Cr. A survey of various media classification, storage and retrieval models as applied to information centers and their operation. Compares traditional models with the logic of manual, mechanical, and electronic retrieval systems.

407-732 Planning Media Facilities (407-532). 2 Cr. Planning physical facilities for media production and distribution centers; large group multi-media auditoria; small group instructional area; and mediated carrels. Consideration of technological and environmental factors. Emphasis on working relationships with architects.

407-747 Communications Media Design (407-547). 2 Cr. Identification of the communication problems through analysis of content, audience, and media. Selection, design and preparation of audio-visual media.

407-751 Programmed Instruction (407-551). 2 Cr. Theory, principles, application, and evaluation of programmed instruction techniques. Survey of programmed instruction techniques. Survey of commercial programs, sources and types of teaching machines. Practice in writing programmed instruction units.

407-759 Seminar in Educational Media Research (407-559). 2 Cr. Implications of significant educational media research and the implementation of research findings in teaching.

407-760 Educational Media Administration (407-560). 2 Cr. Seminar in administration and supervision of school and college educational media programs. Group field projects supplement discussions of related literature.

407-770 Thesis — Audio-Visual Communications (407-570). 2-6 Cr. Independent research under direction of investigation advisor. Selection of problem, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

413-501 Introduction to Guidance (413-401). 2 Cr. An overview of policies and practices of organized guidance programs in educational settings. Emphasis is given to historical, philosophical, and cultural bases for guidance services; guidance techniques for teachers; and cooperative efforts of teachers, parents and counselors.

413-629 Guidance in the Elementary School (413-429). 2 Cr. The nature and conditions of guidance in the elementary school. Curricular and non-curricular guidance techniques, referrals, and parent counseling. Recommended principles and practices in guidance applied to the elementary school child. (Quarter)

413-647 Behavior Problems of Children (413-547). 2 Cr. Understanding the psychological, social and environmental factors which contribute to the developing child's behavior. Primary emphasis is on the cause and treatment of behavioral disorders in children three through 12. Included: methods of observing, diagnosing, documenting and interpreting and underlying behavioral dynamics of problem children. Prerequisites: 479-730, 479-760.

413-655 Human Relations in the Community (413-455). 2 Cr. Consideration of the social, psychological, medical, physical, spiritual and interpersonal aspects of growing into responsible adulthood. (Summer Session only)

413-675 Counseling Theory (413-575). 2 Cr. The examination of theoretical approaches to counseling, including psychoanalytic adaptation, behaviorism, trait-factor, client-centered and other approaches. Each approach is examined concerning the nature of man, the underlying personality theory, goals of counseling, the role of counselor, and illustrative practical applications. The major objective of the course to develop a beginning personal theory of counseling.

413-681 Psychology of Reading (479-465). 2 Cr. A multi-sensory approach to reading development and the remediation of reading disorders.

413-690 Aptitude and Achievement Appraisal (413-490). 2 Cr. Selection, interpretation, and use of tests and inventories for teachers and counselors. Study of achievement, aptitude, interest and personality tests with experience in the interpretation of results.

413-691 Theories of Career Development (413-491). 2 Cr. A study of the psychology of work including career development, the meaning of work, job satisfaction and factors in career choice.

413-700 Seminar in Counseling and Personnel Services (413-554). 2 Cr. Special topics on current developments in the field. Each seminar is devoted to a specific development to be indicated with a sub-title and description.

413-705 Play Therapy (413-505). 2 Cr. A survey and study of play therapeutic techniques. Observation and supervised experiences. Prerequisites: 479-730, 479-760.

413-711 Introduction to Student Personnel Services (413-511). 2 Cr. Critical examination of the history, philosophy and status of student personnel services in American colleges and universities. Particular attention is focused on student activities, residence programs, college counseling and advising, financial aids and records.

413-731 Problems in Counseling and Personnel Services (413-531). 2 Cr. Plan B investigations are the primary purpose of this course. Students who are ready to write their Plan B paper should register for this course and then confer with the major advisor to select staff member who will serve as an investigation advisor. Meetings with the advisor are by arrangement only. Prerequisite: 421-740.

413-734 Technical-Vocational Education Student (413-534). 2 Cr. Review of characteristics of vocational and technical students as it affects their social, physical, emotional and intellectual development in the transition from adolescence to young adulthood. Implications for guidance, counseling, and vocational education.

413-735 The Information Service and Vocational Guidance (413-535). 2 Cr. This course is designed to acquaint the student with occupational, educational and personal-social information, sources of materials and methods of evaluation.

413-736 American College Student (413-536). 2 Cr. Social, emotional, physical, and intellectual development in the transition from adolescence to young adulthood. Implications for student personnel services including guidance, counseling and college orientation.

413-737 Curriculum and methods in Career Education (413-537). 2 Cr. A course designed to provide the student with knowledge of and techniques in organizing, administering and teaching a formal guidance curriculum in the school system (K-12); investigation of ways to incorporate occupational, educational and personal-social information into the school curriculum; development of course outlines and curriculum; methods of working with students in personal, vocational and educational planning are investigated. Prerequisite: 413-735.

413-741 Individual Mental Testing (413-541). 2 Cr. Theory of mental measurement through use of individual assessment procedures. Using individual mental testing for guidance purposes. Introduction to administration of Stanford-Binet, the three Wechsler instruments — WPPSI, WISC and WAIS — and other usable procedures. This course does **not** qualify a student for the administration of individual mental tests.

413-743 Advanced Individual Mental Testing (413-543). 2 Cr. An experience of supervised practice in the administration, scoring, and interpretation of individual tests of mental ability. Emphasis is directed toward the use of such evaluation of intelligence to case history material, the integration of related psychological findings, the determination of prognosis, and planning for the individual client. Prerequisite: 413-741.

413-745 Assessment of Personality (Projective Techniques) (413-545). 2 Cr. History, theory and methodological consideration and studies of projective instruments. Instruction in administration, scoring, and interpretation of some currently used devices leading to a knowledgeable understanding of the instruments. Prerequisites: 413-743 and 413-748.

413-748 Diagnosis and Remediation of Learning Difficulties (413-548). 2 Cr. Diagnostic and reme-

dial approaches to learning difficulties in educational settlings. Prerequisite: 413-741.

413-749 Organization and Administration of Student Personnel Services (413-549). 2 Cr. The study of the philosophical background, the organization and administration of student personnel services in higher education settings. Visits to other campuses. Prerequisites: 413-736 and 413-750.

413-750 Appraising the Individual (413-550). 2 Cr. The case study approach to synthesis of test and non-test appraisal data.

413-752 Group Dynamics (413-552). 2 Cr. A study of group approaches for providing guidance services to pupils. Designed to help counselors and teacher-counselors understand how groups may be used as a setting for guidance and counseling.

413-765 Organization and Administration of Guidance (413-565). 2 Cr. Duties of administrators, guidance directors, deans, teachers, parents, pupils and lay persons in guidance work. A study of types of organization methods of initiating programs and of in-service training.

413-770 Thesis (413-570). 2-6 Cr. Independent research under direction of investigation adviser. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

413-774 Supervised Internship in Student Personnel Service (413-574). 6 Cr. Counseling and guidance with a variety of clients in a variety of settings. Practical experience in several types of personnel services. Intensive study and seminar presentations of a single personnel service, its history, philosophy, programs, evaluation and future prospects. The services which may be studied include residence hall living, student activities, financial aids, counseling and advisement programs, admissions and records. Prerequisites: 413-711 and 413-749.

413-790 Supervised Counseling Practicum (413-590). 4 Cr. A minimum of 120 hours of closely supervised counseling experience through a series of interviews with selected counselees.

413-791 Internship in Guidance and Counseling (413-591). 2-4 Cr. The student will devote a minimum of 360 clock hours, full-time (each quarter), in a local school serving as a school counselor. In this experience, he will be supervised by university personnel and work with a fully certified local school counselor. Experiences include all aspects of the guidance function. The intern should complete two semesters (eight credits) of internship experiences. This course may be repeated.

413-795 Clinical Practice in Educational Diagnosis (I and II) (413-595). 2 Cr. Develop understanding of the roles of the psychological clinician. Supervised clinical experience in diagnosis or/and counseling with individuals, principally in educational settings. May be repeated as 413-795 in the School Psychology I Curriculum. Prerequisites: 413-743 and 413-748.

413-796 Internship in School Psychology (413-596). 4-8 Cr. The student will devote a minimum of 360 clock hours, full-time (one quarter), in supervised internship experiences. The student will be working with a certified school psychologist in local area schools and/or other approved personnel in other approved situations; e.g., a counseling psychologist in the APA approved University Counseling Center. School psychologist trainees should complete eight semester hours of internship experiences. This course may be repeated.

413-800 Field Study (413-600). 2 Cr. Experience in action type field research in pupil personnel services. The student will identify and research a topic directly related to his career position. Preparation and presentation of a formal report of the study to appropriate personnel.

413-865 Organization and Administration of Pupil Personnel Services (413-665). 2 Cr. A study of the pupil personnel services staff in terms of unique, related and integrated functions. Review of organizational and administrative relations and structures of pupil services. Field experiences designed to promote the growth and understanding of students desiring to become system or district directors of pupil services. Prerequisite: 413-765.

413-890 Multiple Counseling and Sensitivity Training (413-690). 2 Cr. A laboratory experience in the analysis and application of group dynamics and group behavior as related to attitude and behavior change. The origin of conflict, cooperation and misunderstanding within groups. Developing insight and sensitivity towards the student's own attitudes towards other people and their own motivation and value systems in human relations.

413-892 Advanced Counseling Practicum (413-592). 2 Cr. Clinical supervised counseling experiences in a variety of school institutional and agency settings. Designed to assist the student to more adequately understand and apply the dynamics of human behavior in the one-to-one counseling relationship. A minimum of 60 to 90 clock hours of experience is required. Prerequisite: 413-790.

413-895 Supervision of Counselors and Counseling (413-695). 2 Cr. Practical applied experiences in the supervision of counseling and counselors; investigation, analysis and application of the psychology of learning and helping as the supervisor assists other personnel services staff in their professional and personal growth and development. Prerequisite: 413-790.

421-505 History of Education (413-405). 2 Cr. Elementary, secondary and higher education in the U. S. from the early colonial period to the present time.

421-541 Classroom Evaluation (421-441). 2 Cr. Types of tests and test questions; the interpretation of test scores and grades by means of simple statistical procedures; methods of grading manipulative work and assigning final grades.

421-596 Mental Health in the Schools (421-496). 2 Cr. A study of the total school community in terms of factors and dynamics contributing to the development or hindrance of the mental health of students, staff, administration, and parents.

421-630 Education for Children with Special Learning Needs (421-430). 2 Cr. This course examines the characteristics of those students who are slow learners due to below average intelligence, learning disabilities, cultural and social differences, emotional problems, and other causes, and considers the implications for educational practice.

421-641 Educational Evaluation (421-516). 2 Cr. Testing; the interpretation of tests by means of simple statistical procedures; methods of evaluating educational programs.

421-650 Drug Education for Teachers. 2 Cr. A series of learning experiences designed to provide educational personnel with pertinent information, knowledge and data concerning the nature, use and abuse of drugs in contemporary society. The course is designed to review the contemporary drug scene and provide educators with insight concerning the problem as well as alternative solutions to this problem.

421-670 Conference Leading (421-470). 2 Cr. Study of teaching. Study and practice of the principles and techniques of conference leading as an instructional device in vocational education.

421-679 Public Relations (421-479). 2 Cr. Defines the public, objectives, and media of public relations in industry and education. Provides practice with such tools as news stories and features. Each student develops a simulated publicity program.

421-681 American Higher Education (421-481). 2 Cr. An introduction to the ramifications of the American system of higher education including history, philosophy, administration, curriculum, students, teachers, and demands for employment.

421-700 Philosophy of Modern Education (421-500). 2 Cr. A comparative study of the main schools of educational philosophy and of their influence in contemporary education, thought, and practice, points of agreement and of conflict.

421-702 Principles of Supervision (421-502). 2 Cr. Basic principles, types, functions, organizations, and plans of supervision. Interpretation and application of creative supervision plans; individual and class projects concerned with applied methods of supervision in selected educational areas.

421-705 Social Thought of American Educators (421-505). 2 Cr. The school as a social institution within American democracy. Contributions of the past to education and current philosophies. Historical review, evaluation and consideration of the public school as a social institution.

421-706 Problems of Supervision. 2 Cr.

421-714 Teaching Strategies (421-514). 4 Cr. Intensive study and practice in mediating the learning process. Focus on the individual teacher and his active role as an instrument which can bring about predictable changes in student cognitive behavior. Minor consideration given to effective and psychomotor behavior. Lecture, discussion and micro-teaching.

421-726 Administration (421-526). 2 Cr. Philosophy and principles underlying organization and operation of public education on the local, state, and national levels in the United States. Examinations of prevailing practices and current problems of school management.

421-727 Supervision of Student Teachers (421-527). 2 Cr. Purpose and philosophy of supervision, the role of the cadet center in preparing teachers, relationships and responsibilities of persons involved, orientation, guidance, and evaluation of student teachers.

421-733 Survey Procedures (421-533). 2 Cr. Procedures and organization for conducting surveys. Application of principles by making and writing the report of an actual survey. Prerequisite: 421-740.

421-738 Elementary School Curriculum (421-538). 2 Cr. A study of the social, psychological, cultural, economic, and educational forces operating to bring about changes in the curriculum of the elementary school, K-8. Outstanding state and local curriculum construction programs. Observation and evaluation of the modern elementary school curriculum trends and innovations. Review of curriculum development.

421-739 High School Curriculum (421-539). 2 Cr. A study of the social, psychological, cultural, economic and educational forces operating to bring about changes in the curriculum of the secondary school. Outstanding state and local curriculum construction programs. Observation and evaluation of the modern high school curriculum, trends and innovations. Review of curriculum development.

421-740 Research Foundations (421-540). 4 Cr. This course serves as an introduction to basic concepts and principles in educational research. The course utilizes mastery grading and elements of individualized instruction. The course functions to help prepare the student for his own graduate research experiences and also to prepare him to be an articulate consumer of research upon completion of the course.

421-741 Design and Evaluation of Curriculum. 4 Cr. The student will use a systems approach cycle to develop a curriculum design for a real or simulated problem situation which requires state level and local level planning.

421-744 Seminars in Education (421-544). 2 Cr. Special topics on current developments in the field. Each seminar devoted to a specific development to be indicated with a sub-title and description.

421-750 Curriculum Theory and Practice (421-550). 2 Cr. A study of curriculum theory and its application. An analysis and development of a rationale, writing educational objectives, identifying a body of knowledge, specifying

methodology and conducting curriculum evaluation.

421-761 Educational Statistics (421-561). 2 Cr. Methods of using statistics in problems commonly faced by teachers and administration in grading, interpreting student data, and making reports and requests. Emphasis on understanding basic concepts and their application in practice.

421-770 Thesis — Guidance (421-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

421-811 Structuring Knowledge (421-611). 2 Cr. Study of methods for structuring knowledge. Relationships between the structure and its application. Structure of knowledge, discipline and curriculum relationships.

421-816 Instrumentation for Research (421-616). 3 Cr. Basic concepts in the areas of validity and reliability will be studied and applied to the design of instruments. Emphasis will be placed on conceptualizing the constructs or characteristics to be measured. Techniques of item writing, item analysis, determining reliability, and scaling will be covered, including such ideas as acquiescent set, item difficulty, and discrimination. The student will engage in the study of procedures and techniques for gathering, analyzing, and reporting data and findings as applied to his proposed field study.

421-841 Basic Research Design (421-541). 3 Cr. Analysis of data and measures of reliability of results. Emphasis on methods applicable to research by means of experiments. Design of experiments to secure maximum information from the research. A thorough elementary discussion of the basic ideas in experimental design. Prerequisite: 421-740.

421-850 Curriculum Theory and Practice (421-550). 2 Cr. A study of curriculum theory and its application. An analysis and development of a rationale, writing educational objectives, identifying a body of knowledge, specifying methodology and conducting curriculum evaluation.

421-862 Inferential Statistics (421-562). 3 Cr. Probability and statistical inference. The general value of the standard error and hypotheses testing. Emphasis on the foundation of analysis of variance and the factorial analysis of variance with three or more variables. The inferential statistics course is organized to acquaint the student with the theoretical bases and the applications of analysis of variance for research problems. Prerequisite: 421-740.

421-863 Sampling Techniques (421-563). 3 Cr. The basic sampling model for equal probability selection; basic sampling methods. Simple and stratified random sampling. Generalizations of the basic sampling model. Common applications of the general theory. Estimations of sample size. The basic sampling techniques course is organized to provide the tools necessary for understanding sampling theory and for drawing representative samples from identified populations. Prerequisite: 421-740.

421-890 Field Study in Professional Education (421-690). 6 Cr. Supervised study which provides the graduate student with the opportunity to: (1) explore in depth the body of knowledge associated with a selected problem in professional education, (2) provide an educational experience for implementing this knowledge into a selected institutional setting, and (3) devise methods to determine if the implementation is or will be successful.

459-503 Physical Disability and Work (459-403). 3 Cr. Etiology, diagnosis, treatment, prognosis, and vocational implications of physical disabilities.

459-505 Communications with the Deaf (459-405). 3 Cr. Basic course in manual communication with the deaf. Overview, history, sociology, and psychology of the deaf, history of manual alphabet, finger spelling, basic manual vocabulary.

459-585 Mental Retardation and Behavioral Disabilities (479-433). 2 Cr. An introduction to the etiology of mental retardation; the psychological, educational, social, and vocational aspects; and adjustment techniques used in working with mentally retarded persons.

459-601 Rehabilitation Methods I: Evaluation. 3 Cr. Review of techniques of assessing the vocational strengths and weaknesses of persons through the utilization of work as the tool for evaluation.

459-602 Rehabilitation Methods II: Adjustment (459-402). 2 Cr. A study of the work adjustment and training, interviewing and counseling, job placement and follow-up process with handicapped and disadvantaged people.

459-680 Principles of Rehabilitation Counseling (459-480). 2 Cr. An introduction to the principles of rehabilitation counseling and their application to the total rehabilitation process. Emphasis is on the principles of case management and the procedures practiced in the state-federal system of vocational rehabilitation.

459-700 Seminar — Vocational Rehabilitation (459-586). 1-2 Cr. A seminar course devoted to the field of vocational rehabilitation and subject materials pertinent to the field. May be repeated.

459-701 Introduction to Vocational Rehabilitation (459-507). 2 Cr. History, philosophy, legislation, concepts and processes of vocational rehabilitation and vocational evaluation.

459-705 Practicum in Rehabilitation Counseling (459-509). 2 Cr. This course is designed to provide supervised practice in rehabilitation counseling within either district office of the Division of Vocational Rehabilitation or within a rehabilitation facility.

459-706 Practicum in Work Evaluation — CF. 2 Cr. A supervised

practicum experience in work evaluation within a community facility. The course is designed to provide for integration of formal course material and practical application while working with potential rehabilitation clients. Prerequisite: 459-723.

459-707 Practicum in Work Evaluation — E&TC. 4 Cr. A supervised practicum experience in the Evaluation and Training Center. The course is designed to provide integration of course material and practical application in working with disabled and disadvantaged clients. Prerequisite: 459-723.

459-717 Occupational Analysis and Information (459-517). 2 Cr. Classification of occupations based on different criteria, methods of obtaining occupational information, methods of job analysis and establishment of worker requirements. Emphasis of courses on the needs, abilities and limitations of disabled persons.

459-723 Procedures of Work Evaluation (459-523). 2 Cr. Methods of evaluating disabled persons in a workshop setting.

459-724 Procedures of Work Adjustment (459-553). 2 Cr. Methods of affecting adjustment in the work personality of the handicapped, concerning such factors as effective work habits, motivational habits, attitude, and responsibility. Methods of job training in rehabilitation facilities. Methods of effective workshop management. Field trips to rehabilitation facilities and industries.

459-738 Psychological Disability and Work (459-538). 3 Cr. Etiology, diagnosis, treatment, prognosis and vocational implications of psychiatric disabilities, mental retardation, and brain damage.

459-755 Problems in Vocational Rehabilitation (459-555). 2 Cr. Identification, selection and completion of a problem in the specialization area of vocational evaluation. The problem project will culminate in a Plan B paper. Prerequisite: 421-740.

459-761 Counseling Technique (459-585). 2 Cr. Study of different theories and approaches to counseling practice. Emphasis is on the techniques applicable to working with handicapped persons in rehabilitation facilities.

459-770 Thesis — Vocational Rehabilitation (459-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, interpretation of findings, and preparation of the final paper according to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

459-780 Administration and Work Evaluation (459-580). 2 Cr. A lecture course covering the administrative aspects and methods involved in establishing and supervising a vocational evaluation unit or a total rehabilitation facility.

459-783 Internship in Work Evaluation (459-583). 4-8 Cr. Supervised 10 week field practice in the techniques of vocational evaluation and work adjustment procedures. To be completed at selected vocational rehabilitation facilities capable of offering the student an adequate training experience.

459-785 Internship in Rehabilitation Counseling (459-584). 4-8 Cr. Supervised field practice in the methods and process of rehabilitation counseling. To be completed at selected rehabilitation agency capable of providing an appropriate field experience.

469-534 Task Analysis (449-234). 2 Cr. Study of analysis of activities for instructional purposes and for personnel work. Job operations, information topics, blocking, custom occupations, service occupations, checking level, progression factors defined.

469-560 Cooperative Occupational Education Programs (469-460). 2 Cr. Philosophy, organization, coordination and teaching techniques of cooperative education programs in the various vocational areas. Roles, responsibilities and duties of the cooperative teacher coordinator.

469-602 Principles of Vocational, Technical, and Adult Education (469-402). 2 Cr. Philosophy, organization and administration of vocational and adult education in the nation with special attention given to the Wisconsin program.

469-608 Issues in Vocational, Technical and Adult Education. 2 Cr. An in-depth study of contemporary issues affecting vocational, technical and adult education. Possible solutions or alternatives will be proposed.

469-674 Adult Education (469-474). 2 Cr. Philosophy and history of adult education movement in the United States. Technique of teaching adults including psychological factors, methods, adult interests and characteristics.

469-710 Coordination (469-510). 2 Cr. Principles of coordination in vocational and adult education, including apprenticeship training, office education, distributive education, home economics, trade and industrial education, health occupations, technical education, and adult education.

469-715 Technical Education Programs (469-515). 2 Cr. Philosophy, principles, operation, and structure of technical education programs at the post-high school level.

469-736 Problems in Vocational Education (469-536). 2 Cr. Identification, selection, and completion of a problem in vocational education culminating in a Plan B paper. Prerequisite: 421-740.

469-746 Seminars in Vocational Education (469-558). 2 Cr. Special topics on current developments in the field. Each seminar devoted to a specific development to be indicated with sub-title and description.

469-770 Thesis — Vocational Education (469-570). 6 Cr. Independent research under direction of investigation advisor. Selection of problems, development of outline, review of literature, compilation of bibliography, plan of method of attack, conduct of research, intepretation of findings, and preparation of the final paper accord-

ing to thesis standards. Student may enroll for two, four, or six semester hours of credit in various terms with a final total of six. Prerequisite: 421-740.

469-773 Problems in Coordination. 2 Cr.

469-784 Internship — Local Vocational Education Coordinator (469-584). 4-8 Cr. Supervised field practice in local vocational education coordination. To be completed at selected schools or CESA agencies capable of providing appropriate experiences.

469-792 Administration of Vocational, Technical and Adult Education (469-592). 2 Cr. Vocational, technical and adult school operation, legal status, policy making, staff personnel, student personnel, programs, public relations, physical plant, business management. Prerequisite: 469-710.

479-530 Psychology of Learning (479-366). 3 Cr. A course designed to acquaint the student with the principles of learning drawn from experimental and theoretical psychology. These principles are demonstrated as they apply to animal and human learning. Modern viewpoints toward theories of learning are emphasized.

479-540 Differential Psychology (479-358). 3 Cr. Nature and extent of differences in individuals and groups are studied. Intelligence, achievement, aptitudes, interests, attitudes, and general personality are the major differences included. Race, sex, nationality, social class and age in relation to individual differences are studied.

479-552 Adolescent Psychology (479-350). 3 Cr. The physical, emotional, social, moral, and intellectual development of secondary school youth.

479-561 Abnormal Psychology (479-431). 3 Cr. A study of more serious mental disturbances. Emphasis on the growing importance of mental disorders and on their early detection and referral is studied.

479-562 Psychology of the Exceptional Child (479-432). 2 Cr. Guidance of the learning and development of children who deviate from the normal, the mentally retarded, gifted, socially and emotionally disturbed, and those with visual, speech and orthopedic problems.

479-571 The Psychology of Marriage and the Family (479-326). 2 Cr. A study of the interpersonal relations involved in dating, mating, and family collaboration with growing awareness of patterns for self-integration.

479-581 Industrial Psychology (479-430). 2 Cr. A survey of the application of psychological principles of man's vocational pursuit. Emphasis is on individual differences and group behaviors which are involved in personnel selection, human factors engineering, industrial safety, motivation, personnel training, and consumer behavior. Course material is based primarily upon the latest behavioral science research in the field of industrial psychology.

479-582 Personnel Management (479-435). 3 Cr. Organization and coordination of personnel practices and methods. Consideration given to communication, employment, orientation and training, working conditions, supervision, performance evaluation, collective bargaining, salary administration, health and recreation.

479-690 Psychological Measurement (479-390). 3 Cr. An introduction to the assumptions, models and applications of measurement techniques in behavioral science. Test analysis, item analysis, reliability, and validity are extensively covered. The course also introduces the student to prediction and measurement of attitudes and opinions.

479-730 Advanced Psychology of Learning (479-555). 2 Cr. The theories and principles of learning are studied with emphasis upon totalistic models of classroom learning.

479-760 Personality (479-513). 2 Cr. The nature of personality and the conditions which make for its wholesome development, its maintenance, and integration is studied. Personality inventories used for self-analysis are also studied.

479-850 Psychology of Development (479-601). 3 Cr. Investigation of individual man, his natures, and development with primary emphasis on the self and implications for education. Study aimed at analysis, synthesis, and evaluation levels through seminar approach.

COURSE NUMBERING SYSTEM

Stout uses a six digit numbering system. The first three digits designate the school and department offering the course. The fourth digit indicates the level of the course. While 500-699 courses may carry graduate credit, such credit is generally awarded **only** to students in graduate degree programs with the approval of their advisor. 700-899 courses may be taken for graduate credit only. 800-899 courses are generally for Ed.S. program students.

(School and departments next page)

INDUSTRY AND TECHNOLOGY (1)

100 Interdepartmental
107 Audio Visual
110 Energy and Transportation
130 Graphic Communications
150 Industrial Management
170 Materials and Processes
190 Industrial Teacher Education

HOME ECONOMICS (2)

200 Interdepartmental
212 Human Development, Family Living and Community Educational Services
214 Apparel, Textiles and Design
229 Food Services and Nutrition
242 Human Development, Family Living and Community Educational Services
245 Habitational Resources

LIBERAL STUDIES (3)

303 Anthropology
304 Art
308 Biology
309 Business Administration
311 Chemistry
320 Economics
326 English-Journalism
328 French
335 Geography
338 History
354 Applied Mathematics
355 Mathematics
360 Music
365 Philosophy
366 Physical Education
367 Physical Education-Men
368 Physical Education-Women
372 Physics
375 Political Science
387 Sociology
391 Speech

EDUCATION (4)

405 Art Education
407 Audio-Visual Education
413 Counseling and Personnel Services
416 Distributive Education
421 Education
459 Vocational Rehabilitation and Manpower Services
469 Vocational Education
479 Psychology

STUDENT PROGRESS SHEET

EVENT	WHEN COMPLETED	DATE COMPLETED
Make **application for admission** to the Graduate College (Form available in Graduate Office.)	At least 30 days prior to first term you plan to take a graduate course. Once admitted, you need make no further application unless you wish to change majors.	
Request that all **transcripts** of work completed at other colleges be sent to the Graduate College, UW — Stout.	At time application for admission to the Graduate College is made.	
Complete **Graduate Record Examination** (GRE), general aptitude section. (Application form available from Graduate Office.)	Preferably prior to admission, but required no later than during first term of attendance in graduate work.	
Receive **Notification of Admission** to a degree program. (Form sent from Graduate Office.)	Within two weeks after all needed materials are received by the Graduate Office.	
Develop degree **Program Plan** (Form available from advisor.)	**Tentative** program at first term of enrollment, **final** plan required with degree candidacy application.	
Register for classes each term. (Materials available from registrar.)	Pre-register as announced by registrar each term **or** on first day of session according to directions.	
Begin research, Plan A or B (Brochure available in Graduate Office.)	May be started during **Research Foundations**, see advisor for details.	
Apply for **Degree Candidacy.** (Form available in Graduate Office.)	After completing nine credits of graduate work, may not enroll for final six credits until admitted to candidacy.	
Request **transfer of graduate credits** from another university. (Form available in Graduate Office.)	As soon as credits are completed, actual transfer is made at time of approval of degree candidacy.	
File **Intent to Graduate.** (Form available in Graduate Office.)	By end of second week of term in which you expect to complete your degree.	
Obtain **Instructions for Graduation.** (Will be sent to all who file an "intent to graduate" during a given term.)	Near end of term in which you plan to graduate.	
File one copy of **Research Paper and Abstract** with Graduate Office. (Instructions for typing and reproduction available in Graduate Office.)	By end of term in which you expect to graduate. This is just like any other course requirement; until it is in, you will not have completed your degree requirements.	
Supply information for **Placement Credentials.** (Information available from Placement Office.)	During last term of enrollment.	
Supply **photograph** of self to Graduate Office. (Any recognizable photo will do; it is only for use in remembering you in future correspondence.)	Any time during enrollment, preferably early in your career.	
Receive **Diploma and Transcripts.**	After all records are clear and degree requirements met, you will receive your diploma and a transcript from the registrar.	